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MARCH 15 1907

THE AUTOMOBILE

WEEKLY

NEW YORK—THURSDAY, MARCH 14, 1907—CHICAGO

10 CENTS

WINTON



IN YOUR OWN BUSINESS

you regard experience as valuable?

That is to say, you increase the salaries of your employees as they increase in knowledge of the peculiar features of your especial line of business?

And, after your house has been in business so long a time that it knows, from experience, what mistakes to avoid and what precautions to exercise in order to secure the best possible results for your patrons and yourselves . . . you consider that your house holds an advantage over newer houses that lack that experience?

Certainly you do, and legitimately so. And applying that same thought to the automobile business, isn't it altogether reasonable that the Winton Company, with experience antedating that of every other American company, and operating the greatest and best equipped factory, ought to produce the best of cars at minimized cost to the purchaser?

It is just this advantage which permits us to market \$3,500 value in the Winton Type X-I-V at \$2,500 and \$5,000 value in the Winton Model M at \$3,500.

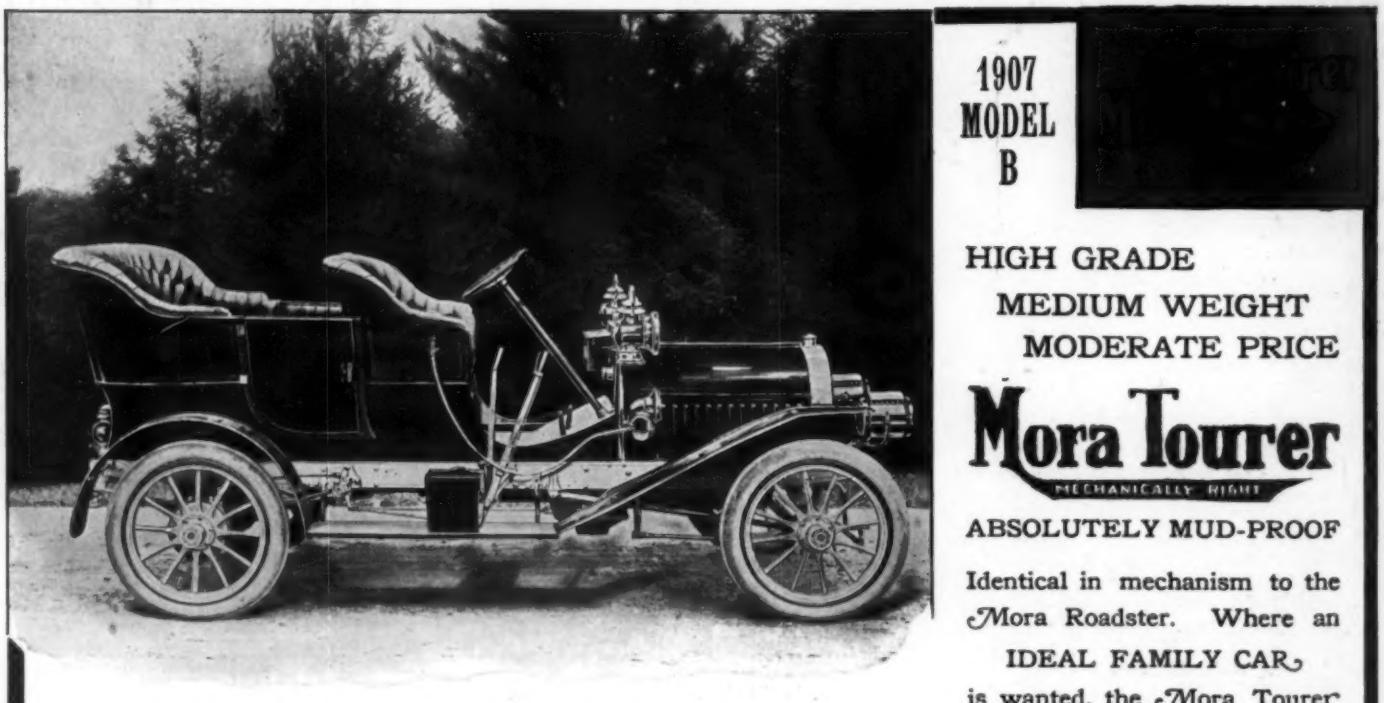
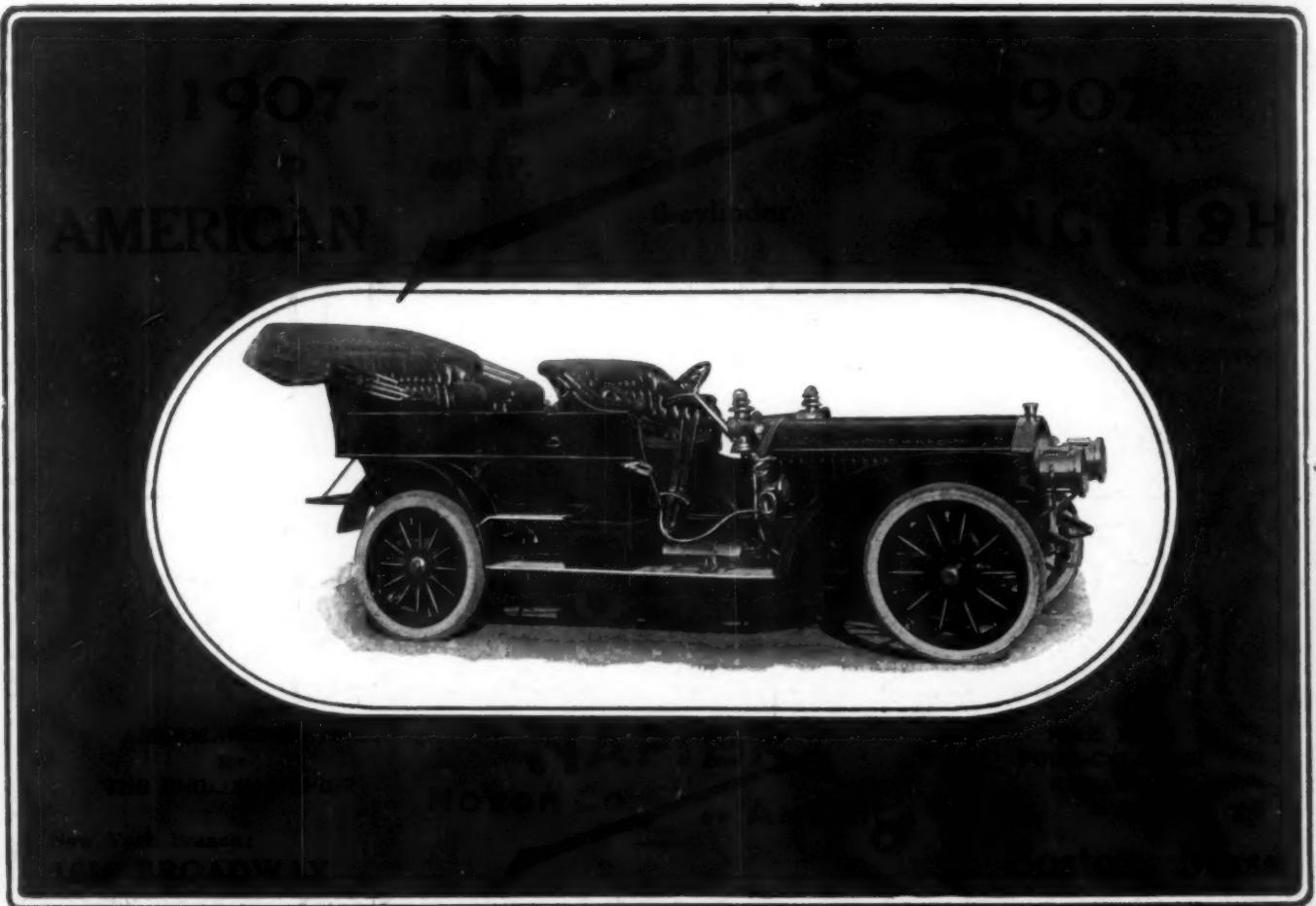
We can give you further evidence of these facts, in detail, if you desire.

TYPE X-I-V (illustrated above)—Four 4 1-2 x 5 OFFSET cylinders; \$2,500. Runabout, \$2,500.
Limousine, \$3,500.

MODEL M—Four 5 x 5 OFFSET cylinders; selective sliding gear transmission; four forward speeds,
direct drive on third speed; multiple disc clutch; \$3,500. Runabout, \$3,500. Limousine, \$4,500.

The Winton Motor Carriage Co., Member A.L.A.M. Cleveland, U.S.A.

We conduct our own Branch Sales Depots in New York, Boston, Philadelphia, Pittsburg, Chicago, Detroit and London



Specifications — Four cylinder vertical engine; 24 horse-power; water-cooled. 103-inch wheel base. 32-inch wheels. Weight 1900 pounds. Entirely mud-proof. Price \$2200.

MORA MOTOR CAR COMPANY
318 Livingston Building
ROCHESTER, NEW YORK
Works at Newark, New York



THE AUTOMOBILE



BOSTON, March 13.—New Englanders are clannish. They prefer to buy and select their autos at their own show. This they have been generously doing since Saturday night last and will continue to do until Saturday night next. No such complete line of American automobiles—a few foreign makes are intermingled—has been placed on view at any previous show of the season. New York, through force of circumstances, had two shows on different dates, and while Chicago contained both the sheep and the goats—separate them according to your own ideas—its total fell short of the number housed in the elongated Mechanics' Building and the annex-serving Horticultural Hall, several blocks up Huntington avenue. The thrifty resident of the Old Bay State, the wooden-nutmegger from Connecticut, the clam-digger of "Little Rhody," the man from the Green Mountain State, he who hails from the Granite-ribbed commonwealth, and the "Down-Easter" from Maine are much in evidence, and from beginning to end the exhibition has the substantial hallmark of New England embedded in an unmistakable manner.

Underneath the Old Apple Tree.

"In the shade of the old apple tree" are the autos picturesquely displayed, and while there is none of the grandeur of the Garden show nor much of the admittedly harmonious dressing of the Coliseum, and thankfully an absence of the dark and dusty draperies of the Palace exhibition, the general effect is

pleasing and novel, suggestive of the coming of Spring and inviting to the owner and owner-to-be and typical of the truly American atmosphere of New England. Here one finds the conservative patriotism that blends reassuringly into the foundation of our great country, and the man whose blood has a Puritan tinge has been quick to appreciate and appropriate the motor-driven vehicle and the blessings that follow in its trail.

Before one reaches the orchard of the main hall he must needs pass through a gradually widening trellised garden; en route his pathway is bedecked with rambler roses, many of which contain cores of electricity; the autos are partially fenced in here and there; shining brass and nickel gleam and glossy enamel reflects so brightly that the fair sex cannot resist the mirror invitation to see if their hats are reposing at the proper angle. Then one bursts into the grand showroom of the apple-blossomed decorations—and wishes, mayhap, that Manager Chester Campbell had bought just a few more apple trees.

Anent the Buying of the Apple Trees.

There was some difficulty, however, in the buying of these apple trees. Manager Campbell thought that he had an option on an orchard, but a farmer's wife who heeded not the mercenary spirit of her liege lord and master cancelled the deal at the eleventh hour. A snow-blown hunt for more apple trees became necessary, and it required some diplomacy on the part of those entrusted



LOOKING TOWARD MAIN ENTRANCE.

with the errand to convince the honest plowman that in selling frozen and rootless trees he was not guilty of obtaining money under false pretenses. At first he looked upon the buyers as if in doubt as to their sanity when they told of their plan to have the trees blossom before Spring. But the price was made, the trees sawed and brought to town, and lo! they are in full blossom for the show.

More Different Autos Than Ever Before Seen.

One hundred and twenty-one different makes of automobiles are scattered about the Boston show, and apparently not a single car of any importance is missing. Up in the galleries—sandwiched in with accessories galore—down in the basement with the motor boats, and up the avenue in Horticultural Hall are on view automobiles of all kinds—gasoline, electric and steam, from eight-cylinders down to one, with four and two-cycle engines, water-cooled and air-cooled, those which have gained the esteem of the buying public and those which are participating in

becoming more pronounced that there is some planning which may make the A. L. A. M. show a November or December event in Madison Square Garden, and the same line of conversation argues for December dates for the N. A. A. M. in Chicago's Coliseum. The A. M. C. M. A. and A. C. A. combination has an eye to the possible revised situation, and the representatives of the two organizations are hereabouts, ears to the ground and watchful of developments. While the Boston show is not national, national figures in the industry are numerous, and the talk of the hotels and clubs this week is automobile from early until late. Now and then the much-discussed Selden patent comes in for some attention, and the chances of a decision before next Winter's shows are weighed more carefully than would have been the case several months ago.

Revolutionizing the automobile industry is not quite as easy as it was a couple of years ago, and one hears less of these assertions as the motor-driven vehicle grows older. The New Englander has been something of an inventor in his day, but the



PAUL REVERE HALL, WHERE THE EXHIBITS OF THE VARIOUS POPE FACTORIES ARE SHOWN.

their débuts. It is an exhibition that tells of an industry's wonderful progress and its assured future.

A Dealers' Show Is Boston's Exhibition.

Successful and as big as it is, this New England exhibition is a dealers' show, for dealers and by dealers, for the purpose of educating the thousands who come in vast degree to learn about something in which they may never have an active part, except some day to be a passenger on an autobus. That opening night snowstorm of complimentaries, which is a Boston idea exclusively, brings to the show a good-natured mob, which peacefully edges its way into Mechanics' Building, congests the aisles, gets a fleeting glimpse of the cars, and emerges into the night, wondering where the money comes from which buys duplicates of those luxurious vehicles. Much good may result from this invasion of probable non-buyers; certainly no harm can result in their attendance.

Earlier Dates for Garden, Coliseum and Boston?

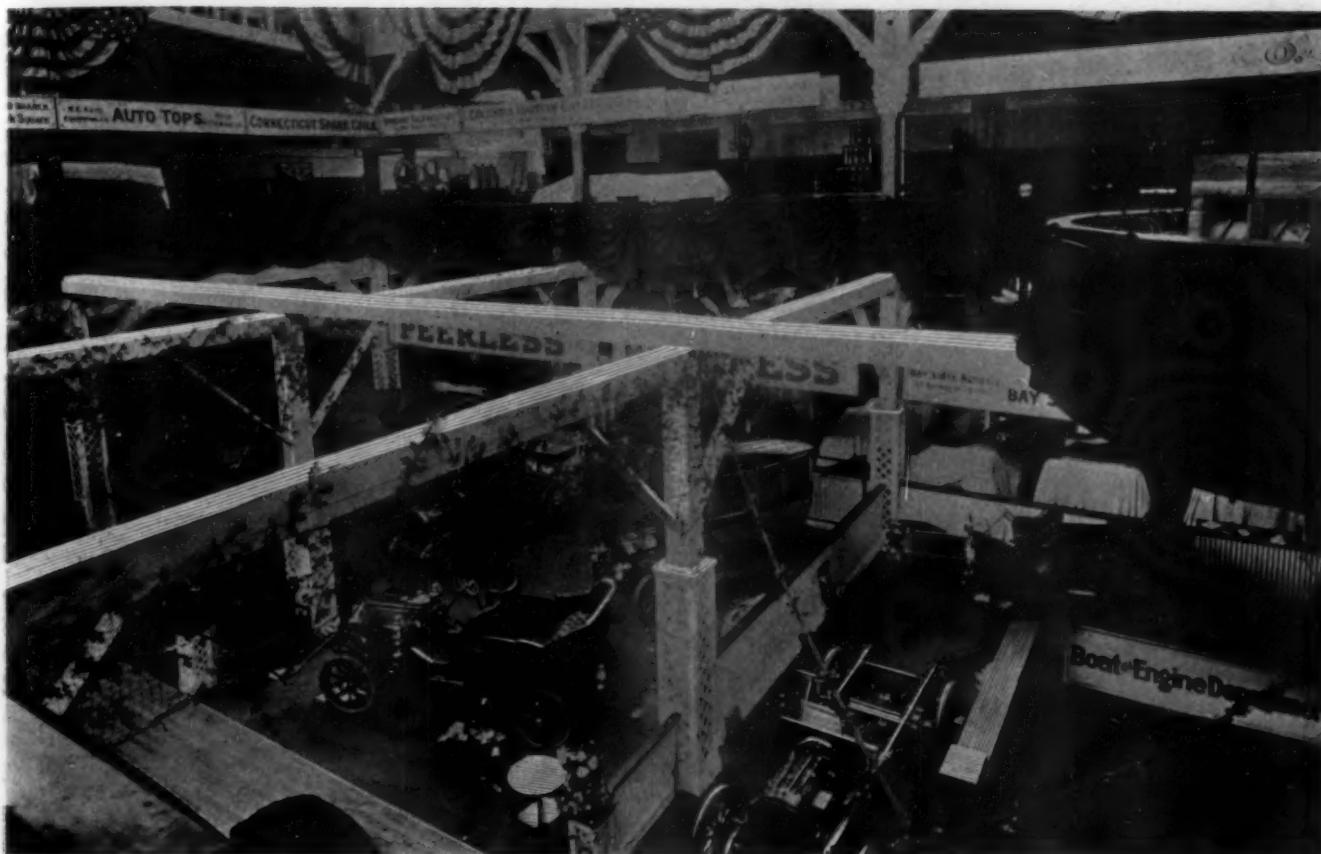
Of the big shows—and, though 'tis a dealers' affair, Boston is included—this one comes the latest, too late, say some of those most interested. But how to have it earlier, with Chicago holding forth in February, is an unanswerable problem. Talk is

automobile has been, and likely will continue to be, a product of gradual development, and so he has not brought forth anything that has disturbed the steady line of progress. While there are new cars in the Boston show, none of them will disturb the equanimity of the established maker. However, several newcomers should bid successfully for a permanent place in the industry. Accessories furnish a prolific field for inventive minds and not a few excellent new things are uncovered for the first time.

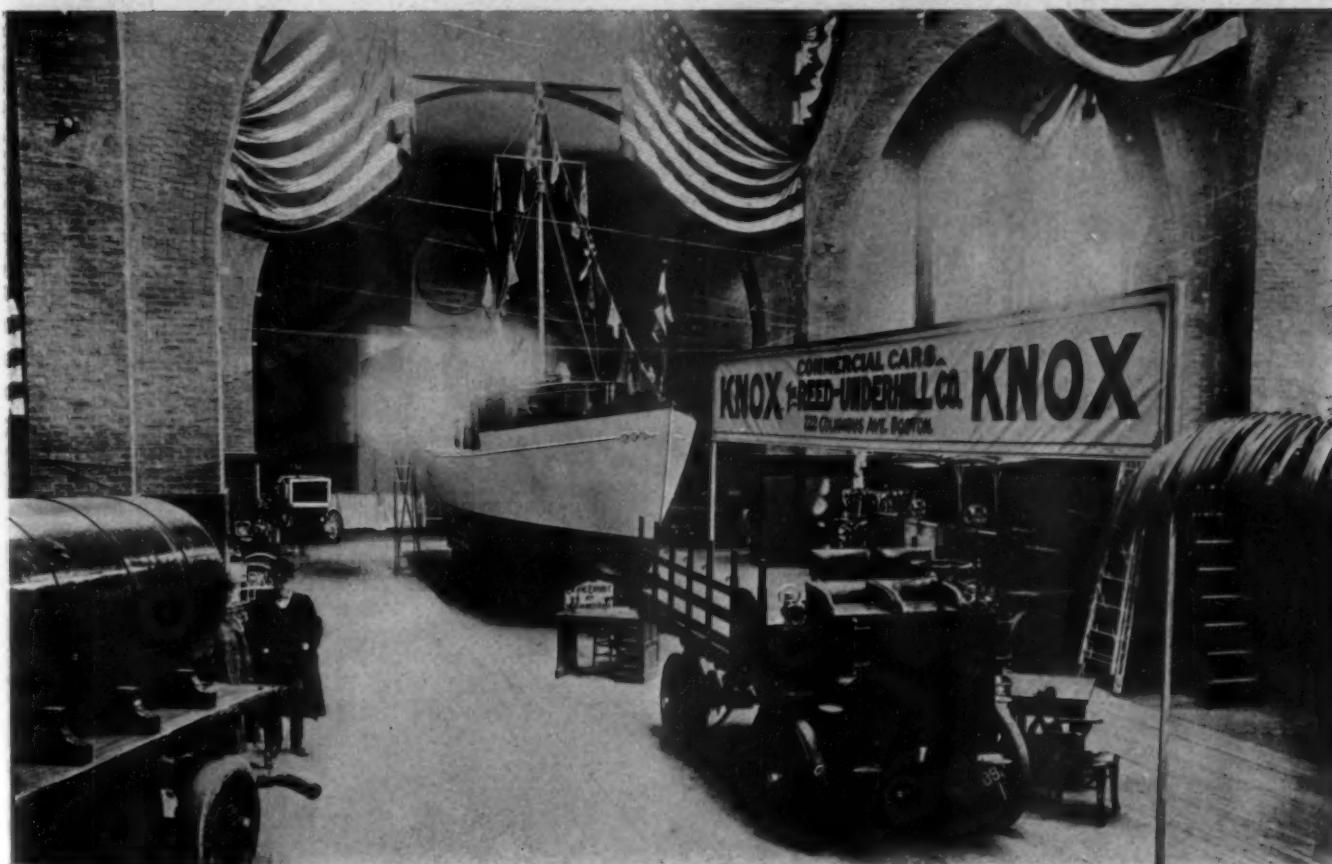
Boston's Auto Clubs Entertain the Trade Visitors.

At the clubhouses of the Bay State Automobile Association and the Massachusetts Automobile Club the visiting tradesmen are being made welcome, and it so happens that most of them are members of A. A. A. clubs in other cities. The national body has an excellent system of reciprocal club privileges, the understanding of which is a convenient asset during show time in the various cities.

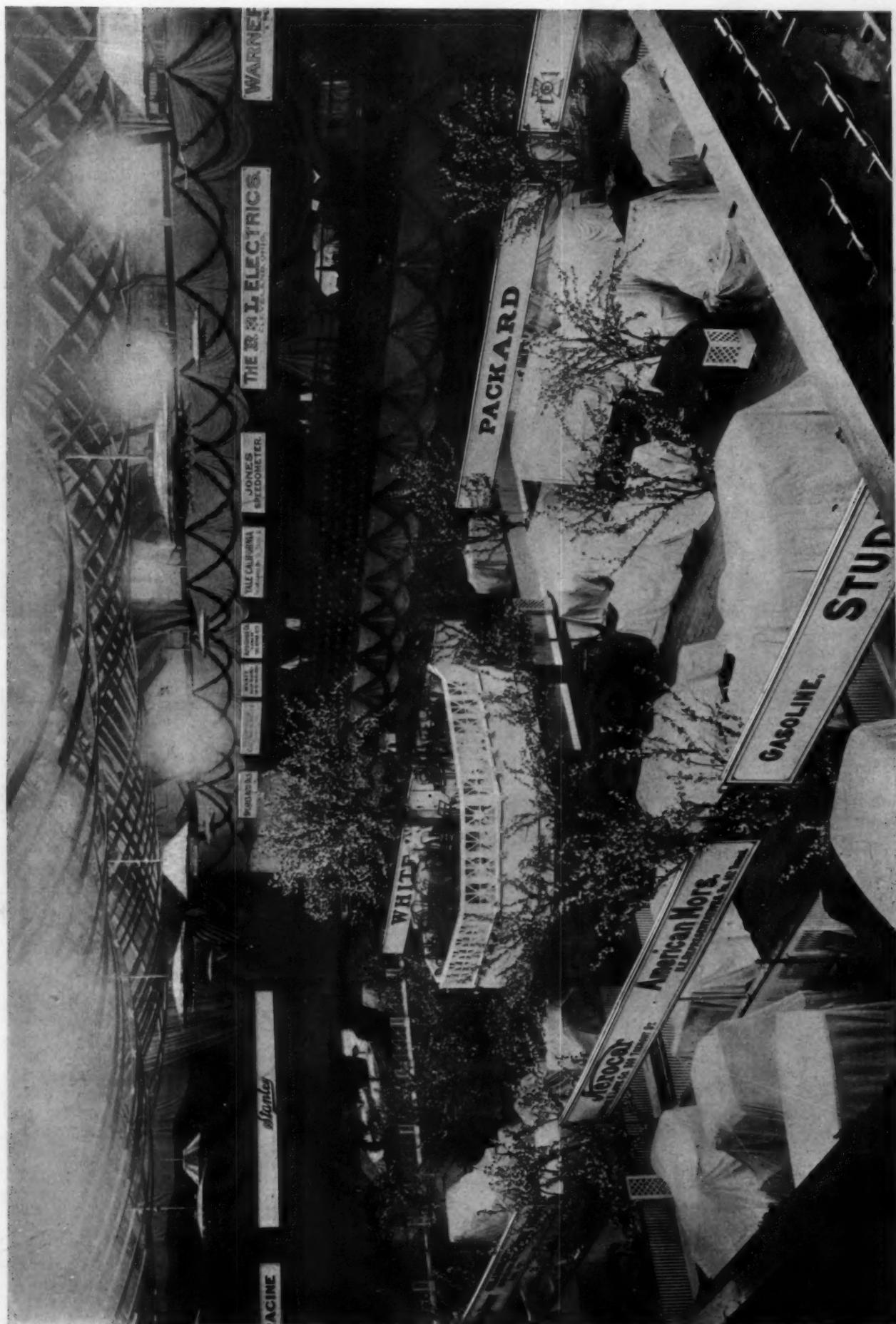
The Wachusett Automobile Club to-night held its annual dinner at the Parker House, President Chase presiding. First Vice-President L. R. Speare, Secretary F. H. Elliott, and Director A. G. Batchelder were A. A. A. guests of the occasion. The program of festivities was admirably arranged.



LOOKING DOWN FROM THE GALLERY IN THE EASTERN SECTION OF THE BIG MECHANICS' HALL BUILDING.



IN HORTICULTURAL HALL A 50-FOOT SEA-GOING MOTOR BOAT CONTRASTED PLEASANTLY THE DISPLAY OF COMMERCIAL CARS.



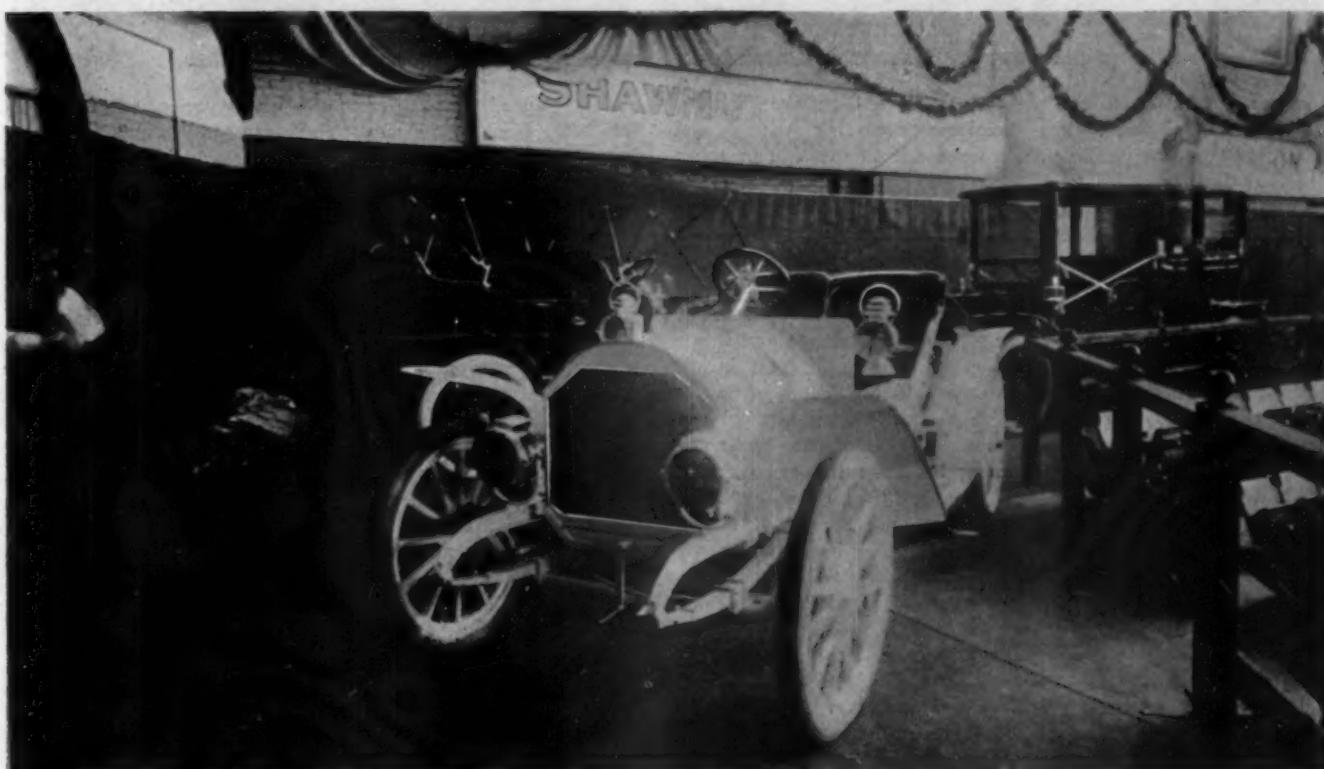
WHERE THE SLEEPING GIANTS REPOSED IN THE "APPLE ORCHARD." THE MAIN HALL HAVING BEEN TRANSFORMED INTO A BLOSSOMED BOWER FOR THE OCCASION.

SOME OF THE NEWCOMERS UNCOVERED AT THE HUB

FACTORY organization and the execution of plans for the building of a high-grade car are not matters that can be perfected at short notice, so that it is unusual to see a car that only made its debut a year ago, having all the earmarks of the product of a number of years' standing. This is the case of the Shawmut, which made a somewhat belated appearance at the Boston show last year, and is now being exhibited in all its glory. It is one of those rare instances in which a new car represents the work of its own builders from beginning to end, with the exception of such essentials as wheels and tires, that lie entirely in the domain of the specialist. What is even more unusual is the fact that, in this case, no attempt whatever has been made to rush a car on the market; the most painstaking effort has been taken to make every part of it as close an ap-

r. p. m. The carburetor is of special design, made in the home factory, while ignition is of the high-tension type, using a Simms-Bosch high-tension magneto as the source of current. Lubrication is entirely automatic and the fuel feed is of the pressure type, the gasoline tank having a capacity of 25 gallons, a tank gauge and hand pump being mounted on the dash. Control is by means of the usual hand spark and throttle levers on a stationary sector mounted over the steering wheel, beside which an accelerator pedal is provided.

One of the original features of the car is to be found in the clutch employed. This is of the multiple-disk type and is composed of 51 disks, but the latter, instead of having perfectly flat contact surfaces as is generally the case, are alternately of concave and convex surfaces. By removing 11 nuts, the entire



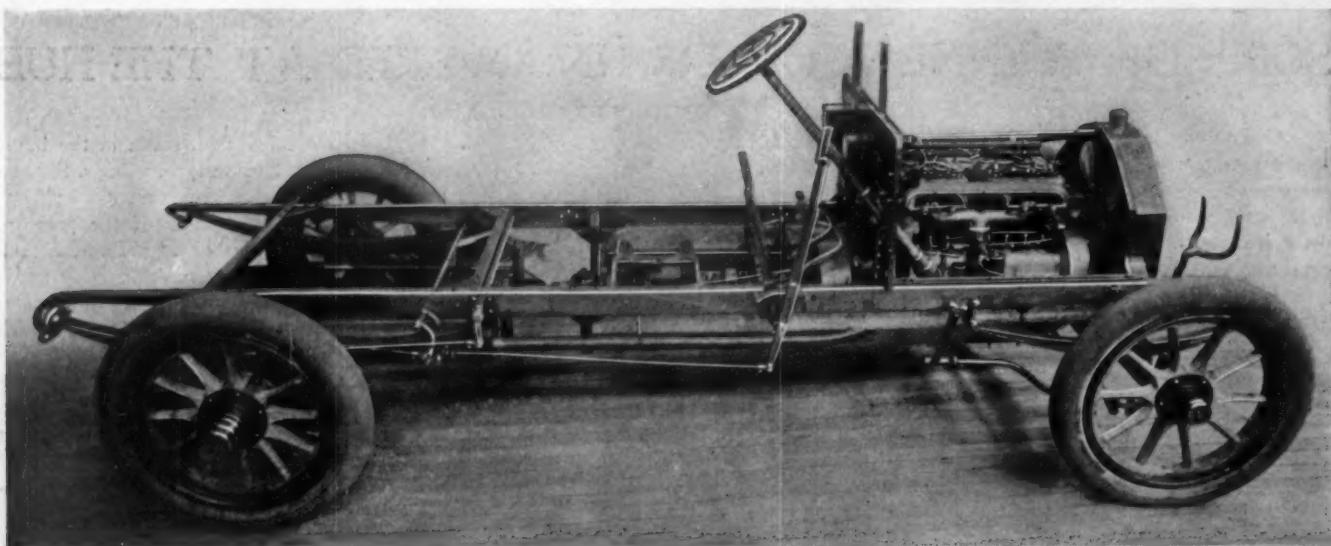
THE EXHIBIT OF THE SHAWMUT MOTOR COMPANY WAS COMPLETE, EACH TYPE BEING SHOWN.

proach to perfection of design as possible, and in the very highest grade of materials obtainable.

The statement of the makers that the Shawmut is *built*, not manufactured, serves to throw some light on the methods used in its construction, and is directly in line with the avowed purpose of the organizers of the company that is its sponsor, to build the best car possible irrespective of cost. No attempt has been made to produce a revolutionary design or a car that would in any way bid for public favor, through its bizarre or unusual features. The result is a car that embodies the very best ideas of engineering schools on both sides of the Atlantic, together with a number of ingenious original features. Four models are now turned out, the same chassis being employed as the groundwork of all of them. This is equipped with a 40-horsepower, four-cylinder motor mounted on a pressed steel frame of the usual channel section, and of the drop type. The motor cylinders are of the best grade of iron, cast independently, and their dimensions are 4 3/4-inch bore by 5 1/2-inch stroke, the engine developing its rated capacity of 40 horsepower at a normal speed of 1,200

clutch may be removed without disturbing either the flywheel or the transmission. A sliding-gear type of change-speed gear, operating on the selective plan of gear-changing, constitutes the next step in the transmission, the gears of which are all of Krupp steel, while the shafts run on Hess-Bright ball bearings of liberal proportions, as, in fact, is true of every other moving part of the car, including the crankshaft of the motor, no less than 47 bearings of this type being required in all. The change-speed gear provides four speeds forward and a reverse, the direct drive being on the third. The front axle is a one-piece drop forging of Krupp steel, and the rear axle is also of imported steel from the same makers. Suspension is of the standard type, using semi-elliptic springs front and rear, the former being 40 inches long and the latter 54 inches.

As an instance of the painstaking care used in the design and construction of every part of the car, it may be mentioned that multiple keyways of no less than six slots are used on all fastenings outside of the motor, and the manufacturers' confidence in their product is well demonstrated by the wording of their



THE CHASSIS OF THE BAY STATE FORTY SHOWS A STRONGLY BUILT AND A STURDY LOOKING CAR.

guarantee, which is to the effect that they will replace "without question as to cause," any breakage occurring within one year from date of purchase, when not due to collision or other external disaster.

A rather noticeable feature about Model A, known as the 40-horsepower roadster, is the fact that it is equipped with wheels of larger diameter on the rear than in front. These are 36 by 4 rear and 34 by 3 1-2 front, Michelin tires being the standard equipment, except where otherwise specified by the purchaser. The drop frame gives the car a pleasing appearance and keeps the center of gravity down, though permitting of 9 1-4 inches clearance. Two sets of brakes are provided, both centered on the rear axle, the foot or running brake operating an internal expanding brake on a special drum, and the hand brake, or emergency, operating a constricting band on the same drum. With full equipment, the roadster tips the scales at 2,675 pounds. The wheelbase is 108 inches and the tread standard. Seats for three are provided, the body being of aluminum and wood and of a special design built at the home factory which turns out all the bodies used on these cars. To protect the mechanism from beneath, a close-fitting sheet-steel pan extends from the radiator to the rear of the transmission case and is made so as to be easily removable.

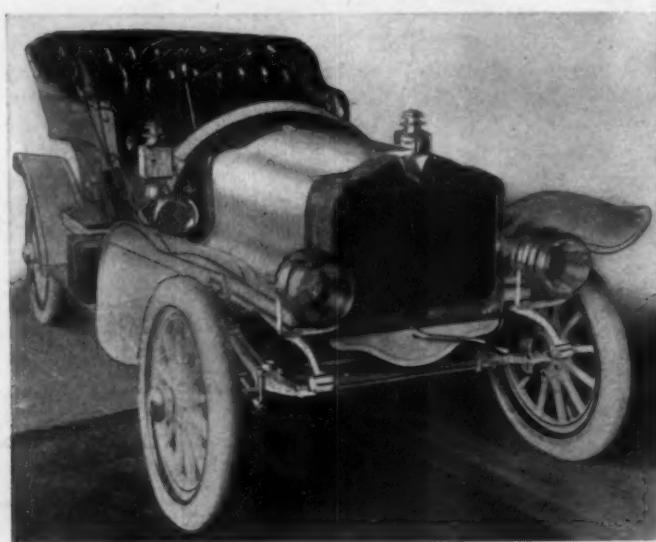
The touring car, known as Model B, differs from the roadster or runabout, chiefly in those points necessitated by the use of a longer body. For instance, it has a wheelbase of 112 inches

and is equipped with the same size wheels front and rear, larger tires being used on the latter; these are 34 by 4 and 34 by 4 1-2, the car in complete running order just reaching the 3,000 pound mark. The body is wood and aluminum, designed along the pleasing lines so strongly favored by Continental body makers—in other words, what is usually referred to as a straight line type. It is finished in ultramarine blue with black trimmings set off by light blue lines, the metal work and lamps all being nickel plated, the roadster being finished in white with black upholstery and also having nickel-plated trimmings. Model C is a 40-horsepower town limousine on a 108-inch wheelbase. It has a seating capacity of seven passengers and is finished the same as Model B, with the exception that the metal trimmings are silver-plated. The remaining model of the line, Model D, is a touring limousine with a seating capacity of eight passengers, and has a 126-inch wheelbase. Nothing that could conduce to the greater comfort of the passengers has been omitted, such as electric lighting, annunciators, mirrors, toilet facilities and the like. The stock finish of Model D is the same as Model C, but as the factory builds all its own bodies, the purchaser is given an option on any finish desired. The various models list at \$4,750, \$5,000, \$5,750 and \$6,500, in the order named.

The New "Bay State Forty."

As its name indicates, this is another home product of the New England soil. It has not been the object of the designers and builders to bring forth a new addition to the line of radical and out of the way cars, but rather to profit by the experience of those who have had to pay for costly mistakes of this kind in the past, and that is what they have done by taking advantage of the established trend of standard practise in every respect. The motor is of the four-cylinder type, the cylinders measuring 4 3-4 by 5 inches. They are cast in pairs and the motor is rated at 40-horsepower, which it develops at a moderate normal speed. The carburetor is of a special type with double throttle, and no less than three systems of ignition are installed. Two of these are entirely separate and independent, one taking current from a set of accumulators and the other from a magneto of the high-tension type working through a single coil and separate distributor. This latter system is duplicated by the use of a second distributor. For lubrication, a force-feed oiler of the mechanical type is employed, a sight-feed being placed on the dash. Control is by means of the usual spark and throttle lever on a stationary sector mounted over the wheel. The power plant entire is suspended on a three-point support employing a ball and socket joint as the third point.

To transmit the power, the first step consists of a multiple-disk type of clutch provided with cork inserts and having a ball-bearing end thrust. The change-speed gear is of the sliding



HOLMES TOURING CAR, WHICH IS BUILT IN EAST BOSTON.

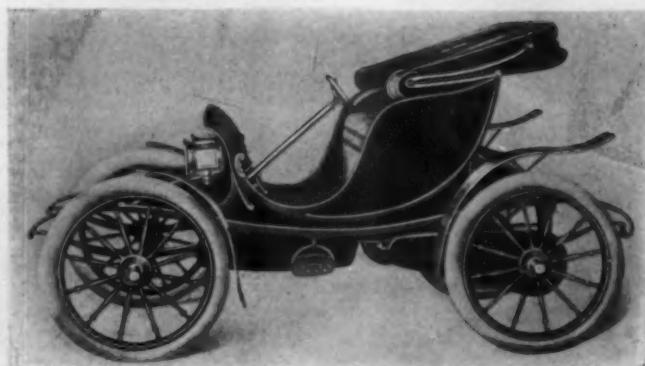
changing is effected by the straight or progressive method, the pinions being of special steel and designed with liberal faces and easy entrance to avoid clashing as much as possible. Final drive is by propeller shaft and bevel gear, a bevel differential being employed.

The foundation of the chassis consists of a pressed-steel frame of the standard channel section, suitably reinforced by cross braces and gussets with the usual I-beam drop-forged front axle; semi-elliptical springs are used front and rear. Two sets of brakes are provided, both of them centered on the rear hubs and of the standard internal expanding and external contracting type, operating by pedal and side lever respectively. The gasoline tank has a capacity of 18 gallons, beside which there is a reserve tank holding two gallons. With a touring body having a capacity of seven passengers, and full equipment, the car tips the scales at 2,800 pounds, which is unusually light for one of its power and size. The wheelbase is 122 inches and the tread standard, 34 by 4-inch front and 34 by 4 1-2-inch tires being fitted. The new car lists at \$3,750, with standard equipment of headlights, horn and tools.

An Electric Among the Newcomers.

Not the least prominent of the newcomers to be found at the show is the Bailey electric phaeton, made by S. R. Bailey & Co., Inc., of Amesbury, Mass. While new to the automobile field, this company has been known throughout the country for the past half century or more as builders of fine carriages, so that they are not altogether new to the making of pleasure vehicles. Few, if any, makers of electric vehicles build them entire, or to anything like the same proportion that is usually manufactured by the builder of gasoline cars, so that the carriage work is a correspondingly more important part of the make-up of an electric, and for this work, the new makers are, as already stated, exceptionally well equipped. In placing the Bailey electric victoria phaeton on the market, their object has been to produce a car for general city and suburban service, and one which, for both pleasure driving and utility, should meet the demands of the most exacting.

The sills of the frame are of patented construction and consist of a composite structure of steel angles and steel plate, which, while very rigid in one direction, possesses a certain amount of flexibility in others. It permits of the use of a very light and yet strong frame. The latter is hung upon four semi-elliptic springs, 40 inches in length. The motor has been specially designed for this service by the General Electric Company, and is wound to run at a potential of 60 volts. Both the motor and differential countershaft are hung in a flexible frame, preventing loss of alignment. From the motor to the differential countershaft, the drive is by means of a Morse silent chain, and from the countershaft to the rear wheels by roller chains, all of which are tightly enclosed in dustproof aluminum cases. The standard battery equipment consists of 30 9-N. P. Gould cells, but the purchaser may exercise his option in this respect and have any battery he prefers installed. The controller gives four



SIDE VIEW OF BAILEY ELECTRIC VICTORIA PHAETON.

speeds forward, the maximum being 18 miles an hour, the purchaser also being given the option of a higher speed if desired. Two reverse speeds are provided. Steering is by wheel of special Bailey pattern, the steering column passing through the dash at a point that clears the footboard enough to give plenty of foot and knee room; the steering column is arranged to swing aside to facilitate entrance and exit. The control lever is placed on top of the steering wheel and is interconnected with the brake, so that putting on the latter shuts off the power, and the latter cannot be applied with the brakes on. Three of the latter are provided, two band brakes on the rear wheels and one on the motor, giving a high factor of safety in this respect.

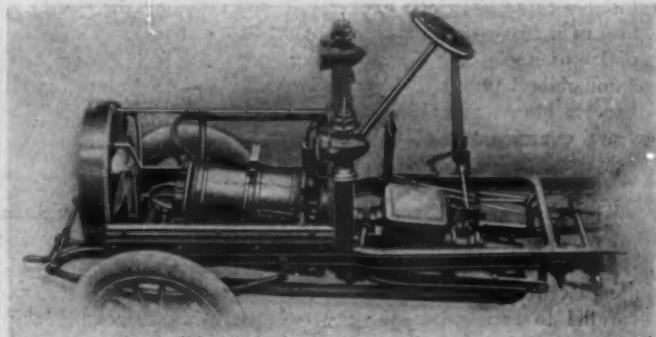
The running gear consists of Bailey oil-bearing, "pivot" axles, which have been a feature of their runabouts for the past ten years. The wheels are of an improved artillery pattern, 34 inches in diameter and carrying 3 1-2-inch pneumatic tires. The electric headlights and tail lamp are from special designs by Gray & Davis. With the standard battery equipment, the car is capable of running 40 to 50 miles on a single charge, and if desired by the purchaser, this may be increased 50 per cent. The car lists at \$2,000, a detachable rumble seat being provided at \$100 extra.

Two Types of the Holmes Shown.

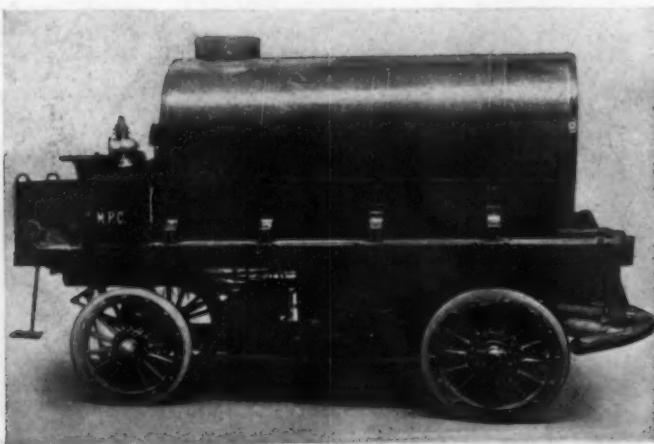
Two different models of the Holmes cars are shown, one of them representing quite a departure from standard practise, in that it is equipped with a double-opposed horizontal motor placed parallel with the frame, but in front and under a bonnet. This construction is facilitated by the use of a friction drive bearing directly against the flywheel of the motor. The dimensions of the motor are 5 by 5 inches, developing 22 to 24 horsepower; ignition is of the high-tension type, using dry cells as the source of current, though provision is made for a magneto. The face of the flywheel of the engine is given a copper alloy surface and comes directly in contact with the friction member of the driving gear mounted on a shaft lying parallel with the frame and not type, giving three speeds forward and reverse, the shafts being mounted on annular ball bearings of liberal dimensions; gear



THE LATEST ROSS RUNABOUT STEAMER LOOKS GOOD.



CHASSIS OF HEYMAN 5-CYLINDER CAR—A NEW COMER.



ATLAS AUTOMOBILE STREET SPRINKLER.

far from it. This friction member is arranged to slide along its shaft, control being by means of the usual side lever, all wear coming upon a special friction material which the makers of the car guarantee to be good for 5,000 miles and which can be replaced at a cost of \$3. The flywheel and friction member are brought together by means of a pedal-operated lever. Final drive is by means of a propeller shaft, fitted with two universal joints. The gasoline tank is placed under the front seat and holds 15 gallons. Tires are 30 by 4 inches. With the standard equipment, the car lists at \$1,350 as a five-passenger touring car, or at \$1,200 as a runabout.

The other car shown by the same builders is known as the Holmes Model H, and is a four-cylinder, 24-28-horsepower car of standard design. The motor cylinders are separately cast, their dimensions being 4 by 4 inches. The valves are oppositely disposed in chambers and mechanically operated, the ignition timer and pump being placed on the forward face of the crankcase and all timing gears thoroughly enclosed. The Holley carburetor is fitted, but if desired by the purchaser, an option on any other standard make will be given. The crankshaft is of high-carbon nickel steel, forged and cut from a billet. The crankcase is a special aluminum alloy, the supporting arms being made fast to the upper half which carries all the bearings, thus making the lower half serve merely as an oil pan. Ample inspection plates are provided and are held in place by thumb nuts so that no wrench is required for their removal. Ignition is of the high-tension type with dry cells, though provision is also made for a magneto on the engine. The transmission of this car is of the same friction type as that already described as being fitted on the Type S, except that it is differently arranged; the entire power plant carrying the flywheel friction disk is supported on a movable sub-frame under the bonnet, final drive being by means of double side chains. The clutch or friction engaging device is operated by means of a foot pedal, speed changing being accomplished by the usual side lever. As a five-passenger touring car fitted with 32 by 4-inch tires, the Type H Holmes lists at \$1,750, and as a two-passenger runabout, at \$1,500, the usual equipment of lamps, tools and the like being provided. While new in the automobile building field, the Holmes Vehicle Company, East Boston, Mass., are old builders of machinery, having had forty years' experience in this line.

The Heyman Car a Radical Departure.

This car may well be termed to represent the greatest mechanical novelty that the show brought forth. The power plant consists of a five-cylinder, four-cycle motor, the cylinders of which are placed round the circumference of a circle with their axes parallel to each other, the nest of five being surrounded by a single sheet-brass casing or waterjacket. The cylinders, which measure 4 1-2 by 5 inches, are ground internally and externally, all joints being conical and ground to fit, in order to obviate the

use of packing. The engine is a sort of straight-line type, the connecting rods all working on a single crank. The rods have hardened ball ends and work in hardened sockets; they travel in practically a straight line, as their maximum deflection is but 5-16 of an inch. The pistons are ground and fitted with four eccentric rings. Alternate cylinders are fired in sequence, five impulses taking place during every two revolutions of the crank-shaft. The explosions are thus 140 degrees apart, lapping each other by 50 degrees, so that a constant turning effort is produced. Both the suction-mixture being supplied by a Schebler carburetor—and the exhaust of all five cylinders is handled by a single, conical, rotary valve, while an automatic oiler mounted directly on the engine takes care of the lubrication. The pump and ignition timer are also attached to the engine and are driven by hardened spiral gearing, ignition being of the high-tension type through a single coil. The engine is placed forward under the bonnet at an angle from the horizontal to bring it in practically the same plane as the driving shaft.

The change-speed gear is also of an unusual type, using roller clutches giving any desired ratio of speed between the engine and the rear wheels, so that with the lever in its minimum position the engine will run at 500 r. p. m. and only rotate the driving wheels once per minute, while in its normal position, 1 1-2 revolutions of the engine produce one turn of the rear wheels, any ratio between these two extremes being available. A sector giving 20 positions or speed changes is provided. Final drive is by cardan shaft with two universal joints of improved design. The frame is of the usual pressed-steel, channel-section construction, running on 34 by 4 1-2-inch wheels with a 108-inch wheelbase. Tread is standard and all on the car weighs 3,000 pounds, suspension being by means of semi-elliptic springs, 36 inches in front and 48 inches in the rear. The car is given a distinctive appearance by the use of a Whitlock radiator of round form. With the usual equipment, consisting of head and tail lights, tools, etc., the Heyman lists at \$4,000.

First Gasoline Sprinkler Shown.

One of the novelties that attracted a great deal of attention was the sprinkling wagon with its business-looking steel tank at the exhibit of the Knox Motor Truck Company's stand, in Horticultural Hall. This type of commercial vehicle is not exactly new, as it has had forerunners in the electric field, but it is the first of its kind to be driven by a gasoline engine, and further interest is added by the fact that this of the two-cylinder, two-cycle type specialized by these builders in their heavy trucks. The tank has a capacity of 800 gallons and can sprinkle a swath 24 to 28 feet wide, which, with its speed of 10 miles an hour, will give it the capacity of no less than four of the old-time horse sprinkled wagons; in other words, the one man in charge of this machine will be able to accomplish the same amount of work as four drivers and wagons and eight horses. The new automobile sprinkler has been ordered for use on the Revere Beach Reservation during the coming summer.

A New Tire Among the Accessories.

The only new thing to be uncovered in the field of tire making is the Butler tire, which is neither a pneumatic nor a solid, nor, on the other hand, a spring wheel, though in some respects it partakes of the characteristics of all three. Fastened to the felly of the wheel is a slotted rim of peculiar construction in that it provides accommodation at either side of the felly for two series of helical wire springs, which have members extending across the rim at certain intervals all the way round. The tire itself is a cross between a clincher and a detachable type of shoe and is made fast by means of a number of bolts passing through the felly. This holds it to the rim and it is supported above by the spring members referred to. The new Butler tire is being placed on the market by the Massachusetts Automobile Company, Church street, near Park Square, Boston, a concern that is one of the largest dealers in second-hand cars at the Hub, if not in New England.

THE BARKER-WHITE SYSTEM OF UTILIZING ALCOHOL

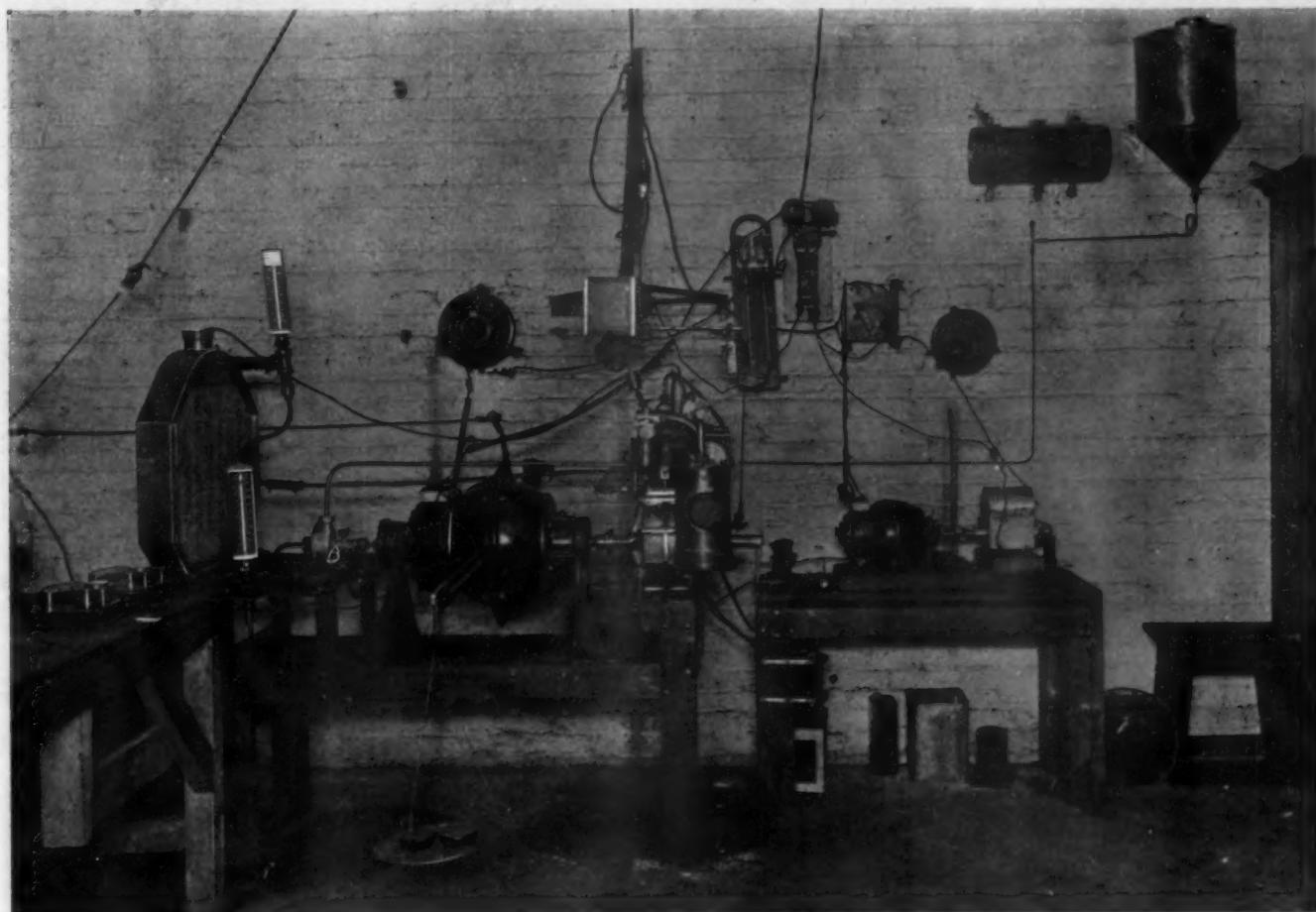
AS is probably well known to the majority of autoists, the use of alcohol as a fuel for the internal combustion motor is something that has occupied the attention of scientists and engine designers for quite a number of years past. Of course, this has been true only of the Continent, and no time has been devoted to the subject here prior to the passage of the recent legislation exempting denatured alcohol for industrial purposes from taxation, for the very natural reason that, even had it been greatly superior to other liquid fuels, it was not practical from an economic point of view owing to the tax. During the decade or more that has elapsed since the inauguration of the policy of Government support that has been so consistently adhered to in Germany, the alcohol motor has been made the subject of exhaustive experiment and investigation, and there are at present thousands of motors of various kinds used abroad with alcohol as a fuel. Those who are at all familiar with the subject are aware of the result; success with alcohol as a fuel has only been attained by the use of high compression, a long stroke and a slow speed—factors all of which contribute to the design of a motor whose weight per horsepower is unduly high, and in consequence unsuited to the needs of either automobile or light marine work in the motor boat.

Alcohol and Acetylene Compared.

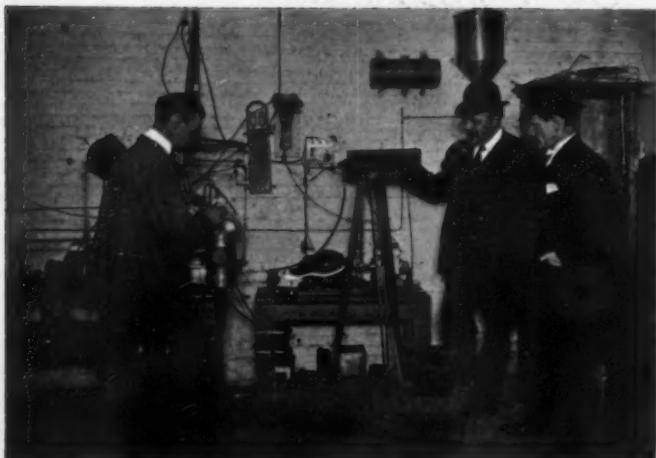
Alcohol is a definite compound, and its chemical composition is such as to preclude its burning sufficiently fast to permit of its use in a high-speed motor with any great degree of efficiency. By weight it consists of oxygen 34.8; hydrogen 13.0, and carbon

52.2; these figures are approximate and refer to pure alcohol which is commercially impractical. The ethyl or grain alcohol of commerce seldom contains less than 10 per cent. of water. This not only lessens its calorific value as compared with other fuels, but doubtless also tends to retard the rate of flame propagation, owing to the presence of the steam generated. An equally great objection to its use on the automobile is the length of time required as well as the necessity of heating in order to start, and the high temperature which must be maintained both in the vaporizer and the motor in order to realize anything like the maximum efficiency.

Acetylene, on the other hand, is a compound consisting of equal parts of carbon and hydrogen, and for that reason is found to be at quite the other extreme. In combination with 14 to 15 parts of air its explosion is so rapid and the pressures realized so great, that detonation more accurately describes its action. Although 12 1-2 volumes of air are required to burn it, and the most effective mixture is that already referred to, mixtures as weak as 18 to 1 will ignite readily, and in the experiments made by Grover even so lean a mixture as 30 to 1 showed an initial pressure in the cylinder of 180 pounds to the square inch, with a compression of but 30 pounds. Grover continued his investigations of acetylene as a fuel over several years and gives the characteristics of the explosion of a mixture of acetylene gas and air as follows: Great rapidity of flame transmission, a pressure of 120 pounds to the square inch being realized in .02 of a second from an explosion at atmospheric pressure; high combustion temperature and extraordinary amount of energy de-



ENGINE AND GENERATOR TESTING APPARATUS USED IN EXPERIMENTING WITH ALKOETHINE.



MESSRS. BARKER, WHITE AND TRACY DEMONSTRATING ALKOETHINE.

veloped, indicating that the thermal efficiency attainable with a motor using it as a fuel would be greatly in excess of any other known.

The Barker-White Combined System.

The foregoing data is given merely to show the status of these two substances as fuels for the internal combustion motor when the matter of investigating the possibility of using both in combination was first attempted by Thomas L. White, who has been granted a patent on a system of this kind, jointly with F. W. Barker (No. 839,798, Dec., 1906). Numerous experiments had been made with alcohol engines and a great many motors using this fuel had been in use over an extended period, their characteristics already having been referred to, and the possibility of using acetylene as a fuel had also been investigated at some length, though without any practical outcome so far as the actual building and commercial use of such a motor was concerned, when Mr. White conceived the idea of taking advantage of the extreme characteristics of both by combining them.

This he has done in what is known as the Barker-White system of utilizing a combination of these fuels, and though still in the experimental stage so far as the design of the apparatus to be ultimately employed is concerned, more than enough has been accomplished to demonstrate beyond a doubt what great promise a commercially practical method of effecting this holds forth. As is well known, the method of producing acetylene gas is by bringing water in contact with carbide of calcium, and this has been taken advantage of in connection with the fact that commercial alcohol always contains a certain percentage of water, thus affording a means of regulating the character of the mixture, as passing pure alcohol over the carbide would not affect it. Anhydrous alcohol is, of course, not an impossibility, but the process of distillation required to entirely free it of water is so long and expensive as to make it economically impracticable. However, the presence of water in the alcohol in the first instance is not a drawback, as it has been possible to greatly increase the quantity of water and still obtain excellent results. In fact, tests have shown that the greatest amount of power is obtainable from a mixture consisting of 19 per cent. water and only 81 per cent. alcohol, its density being ascertained with a hydrometer.

Description of the Testing Apparatus.

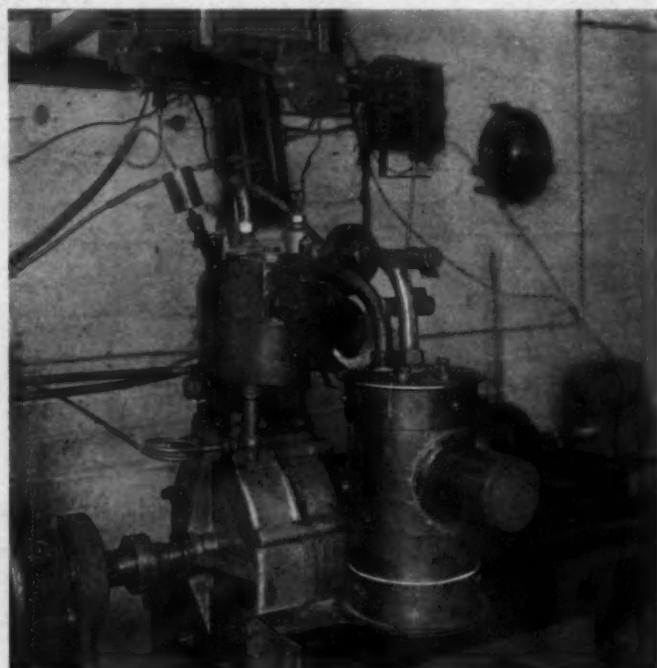
For experimental purposes a single-cylinder, 3 1/2-horsepower, water-cooled De Dion motor has been employed, direct connected to a multi-polar direct-current generator, the fields of which are supported on ball bearings, so that the drag on the latter may be measured. The power developed is dissipated through a resistance consisting of a bank of lamps placed in a closet so as not to interfere with the use of the manograph. The mixture of alcohol and water is fed by gravity to a carburetor of the regulation float feed type and the alcohol spray

produced by the latter is led to a comparatively large chamber placed close to the cylinder. In this chamber a small amount of calcium carbide is placed on a wire screen so as to be directly in the path of the incoming alcohol spray. The suction of the motor draws the latter through this carbureting chamber and the water contained in the alcohol generates a corresponding amount of acetylene gas. In order to prevent any dust from the carbide being drawn into the combustion chamber of the cylinder a screen is interposed in the intake pipe.

While a carburetor has been employed in these early experiments, it is anticipated that its use will be found superfluous; as equally good, if not better results, will doubtless be obtained by spraying the alcohol directly on the carbide, after the Deutz or similar systems. The same is true of the carbureting chamber itself, which has been made unnecessarily large owing to the crude state of development of the apparatus itself. Experience has shown that the consumption of carbide is very small, and it is thought that a method of feeding it, patterned along lines somewhat similar to that used in the shaking grate type of generator, will be found satisfactory; that is, employing two inclined perforated plates or screens between which the carbide will be held. These and other mechanical details, such as the best size of the chamber, method of spraying the alcohol and the like, are matters that have to be worked out.

Theory of Alkoethine.

As has already been mentioned, alcohol burns very slowly, something like 1-20 of its total latent heat being required to burn it. This refers to absolute alcohol, and as the proportion of water increases, this factor grows correspondingly, which accounts for the fact that it has been found necessary to use a compression of 100 pounds or more with an r. p. m. rate of less than 500, together with a much longer stroke in order to build an efficient motor for use with alcohol as a fuel. This is taken advantage of by varying the proportion of water used, which in turn has a corresponding effect on the volume of acetylene generated. The resulting compound has been christened "alkoethine" by the inventors, and it is their theory that the mixture of air, alcohol vapor and acetylene gas is practically intermolecular, the heat generated by the conversion of the carbide into gas assisting materially in the vaporization of the alcohol. The theory of the action taking place in the cylin-



CARBURETING CHAMBER AND CONNECTIONS.

der when this fuel is employed is that the occurrence of the spark at the plug causes an instantaneous rise in pressure in the strata immediately surrounding it, and the molecules of acetylene gas throughout the mass are immediately detonated, serving to ignite the alcohol content without loss of time, so that the maximum thermic value of the fuel is obtained, com-



TRACING OF MANOGRAPH CARD; GASOLINE AT 1,300 R. P. M.

bustion taking place at minimum volume or highest point of compression, as is shown by the fact there is less necessity of advancing the point of ignition in order to obtain the maximum power, than is the case with gasoline. Combustion is not in progressive strata, as is thought to be the case with the latter, but more in the nature of a true explosion. The carburetion process is entirely independent of the r. p. m. rate of the motor, as it is purely a chemical action, the mixture formed being much more homogeneous and thorough than could possibly be obtained by any mechanical means.

That a thermal efficiency, equivalent, or even superior, to that of gasoline is obtainable in a motor of the standard current design, may be seen from the fact that acetylene gas contains 21,492 B. T. U. per pound and gasoline vapor 21,900 B. T. U., while the thermal value of absolute alcohol is 28,500 B. T. U., the latter decreasing according to the extent of its hydration. But as this is practically disposed of when the alcohol spray comes in contact with the carbide, the latter robbing it of by far the greater part of the water, there is every reason to believe that the resulting mixture is a vapor having a value in B. T. U. somewhere between that of acetylene as above given and absolute alcohol, and consequently in excess of that of gasoline. The use of this mixture has also been found to overcome the

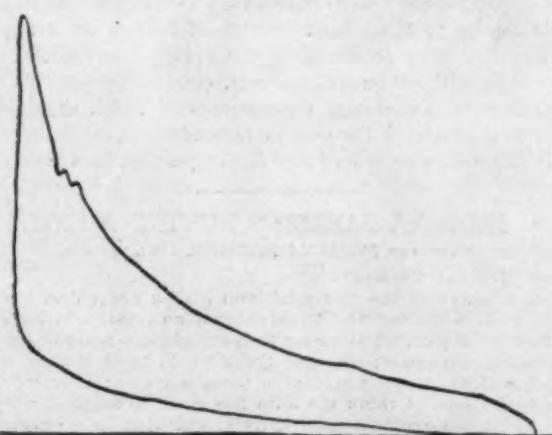
equal, if not superior, to that of gasoline is readily obtainable. No quantitative tests have as yet been made, but from the data obtained it is thought that the consumption of carbide will amount to about one pound per gallon of alcohol. Various proportions of alcohol and water have been tried, ranging from ten to twenty-five per cent, but at the latter point the explosions are of too violent a character, due to the large acetylene content of the mixture. A mixture containing seventeen to twenty per cent of water has been found most advantageous, cards shown by the manograph when running on a nineteen per cent. mixture giving an initial pressure of 240 pounds to the square inch and producing almost ideal pressure and expansion lines, the compression of the motor being 65 pounds to the square inch. A large number of tests of this kind have been made and in the majority the range of mixtures referred to, i.e., alcohol containing seventeen to twenty per cent. of water, have been found to produce practically a characteristic gasoline card in the manograph, and, in some instances, a much straighter pressure line, indicating the greater rapidity of the combustion due to the presence of the acetylene gas. This is strikingly shown by the accompanying tracings of the manograph indication; in taking the latter no attempt was made at accuracy, as it is merely a pencil tracing from the ground glass of the instrument, and it is only reproduced here to give an idea of the character of the curve obtained. Both cards were taken from the same motor under similar conditions, one while using gasoline and the other with alkoethine, so that a comparison may readily be made, the latter card showing a much higher pressure line with an equally good expansion curve. It was also found possible to speed the motor to 2,100 r. p. m. under load, though its normal rate was 1,750.

That this system holds forth great promise commercially as a means of bringing alcohol on an economic plane with gasoline is quite evident. Present legislation on the subject, as altered by the recent amendments, makes it possible that denatured alcohol will be produced in the near future at a price very close to that at which gasoline is now marketed. Even in small quantities carbide now sells at three or four cents a pound and the cost of the latter is more than offset by the increase in the volume of the alcohol used by reason of the added percentage of water required.

AUTOS SUCCESSFUL IN POSTAL SERVICE.

WASHINGTON, D. C., March 11.—Representative Overstreet delivered a speech in the House of Representatives on the bill making appropriations for the postal service, in the course of which he called attention to the fact that for the last several months the Post-Office Department has been experimenting with reference to the rent of automobiles in the collection of mail and also in the distribution, which results in great expedition of the service. He stated that testimony was given before the Committee on the Post Office and Post Roads to the effect that while the charge for the individual automobile, including the driver, was considerable, yet the territory over which that vehicle could dispatch mail and from which it could collect it was so large that it covered from two to four collection districts where the mail was collected and distributed by the carrier with the aid of a horse and cart. He further explained that those individual mounted carriers who were displaced from the collection and delivery by horse and vehicle were then utilized in other parts of the territory and were not put out of the service. It was found, however, continued Mr. Overstreet, that great economy resulted from that change of practice.

"For example," he said, "I think in the city of Baltimore the experiment was very satisfactory, not only on account of the topography of the city, of the hills up which the wagons were obliged to be hauled, resulting in retarding the delivery of the mails, but, taking into consideration the number of mounted carriers to one district covered by an automobile, it resulted in a very material reduction of total expense."



TRACING OF MANOGRAPH CARD; ALKOETHINE AT 1,400 R. P. M.

production of acetic acid, which invariably accompanies the use of alcohol alone, giving rise to corrosion of the cylinder walls and more or less pitting of the valves.

Some Experimental Results Obtained.

As yet investigations have not proceeded to any length, but experiments already carried out demonstrate that an efficiency

MEN WILL AUTO FOR HEALTHFUL RECREATION

BY CHARLES JEROME EDWARDS, TREASURER LONG ISLAND AUTOMOBILE CLUB.

THE future of the automobile industry will, I believe, be shaped, not so much by the man of wealth who inclines toward extravagance, but, instead, by the man of moderate income and modest pretensions, who will take up automobiling solely for its recreation and healthful features. In other words, the conditions of the future must be shaped somewhat by the demand of the enlarged clientele. My own belief is that we are at the parting of the ways; that we have reached the time where there will be two classes of cars—the very high-priced car, such as are represented by the foreign makers, for instance, and the medium-priced car, averaging, say, from \$1,500 to \$2,500. And to my mind the success of the automobile industry purely as a commercial proposition rests upon the ability of the manufacturers to provide for the general public this latter vehicle.

The good times and exceptional prosperity which all peoples have enjoyed during the last few years are surely to be followed by some one or two years of "hard times" at no very remote day, possibly three, possibly five years from now. This will hit the high-priced car very hard, and those of us who are enthusiastic and love automobiling, who may suffer thereby, will perchance have to be content with a less expensive creation.

The great field of the automobile in the future is to be among those who are new buyers, recruits to the army of amateurs who really have made the automobile industry. I think it will be agreed that, commercially speaking, the automobile has so far filled no great sphere, although of course a revolution will cer-

tainly be worked along those lines—but that, as I understand it, is not a subject under discussion. The future recruit to automobiling will very largely be the man whose income limits him to the low-priced car, and we find that sentiment extended all over the country. This is exemplified by the fact that the enormous number of second-hand cars which are disposed of each year go into country districts, and are in a sense an advance agent to reach the enthusiastic buyer of the future.

The era of good roads into which we are just entering will make every farmer of means, and the storekeeper and man of affairs in the various villages throughout the country, a convert to the use of the automobile, and his wants and opportunities are met by the low-priced car.

The recent show at the Garden was full evidence that the automobile manufacturers have in mind the production of this class of car—a moderately high-powered and reliable motor, which does not require an expert or non-expert chauffeur in order to handle it, but which can be understood and repaired by a man of average ingenuity and judgment.

This view of the situation is largely warranted by the fact that it was the single-cylinder machine which attracted buyers, and probably nine men out of ten who own high-priced cars began with the low-powered, inexpensive car. My theory is that the future will see nine men out of ten who become automobilists will do so because they can secure a good, reliable car at a comparatively small cost.

THE ENORMOUS DEMAND WILL CONTINUE.

BY E. R. THOMAS.

PRESIDENT E. R. THOMAS MOTOR COMPANY, BUFFALO, AND E. R. THOMAS
DETROIT COMPANY, DETROIT.

The enormous demand for automobiles experienced during the last year will continue throughout 1907. This demand enabled every manufacturer of a popular make of car to dispose of his entire output to dealers months ago. For the high class cars, the supply is entirely inadequate, and customers are already offering premiums to those who ordered early for their turn in delivery.

Our own condition right now is a truthful illustration of that with that of the leading manufacturers. We have orders on our books for cars amounting to \$5,500,000—over 1,500 automobiles—and with each one there is a deposit made to bind the contract. This is more than double the amount of business done last year.

As with every business, there are those who say every year that the demand is now at its height, and that it cannot last much longer. There is no truth in this, according to my lights. The demand that we have with us now will continue; the field is spreading all the time, and instead of the automobile industry being in danger of a slump within the next few years, it is my honest opinion that it is growing every day, and that the established manufacturers will be on an even sturdier foundation and be doing a greater amount of business a decade from now.

WASHINGTON STATE IS BUYING MANY AUTOS.

SEATTLE, WASH., March 2.—Automobiles in great numbers for Seattle people have been tied up at various points along the roads westward, owing to the recent snow storms. They are now commencing to dribble through, and the agencies here are happy. Business here has been phenomenal thus far in the year. No less than 410 cars have been disposed of by Seattle agencies, a fairly good proportion of which are for various Puget Sound points. The aggregate value of the cars is \$600,000. This by no means represents the entire business to the Sound, as there are agencies in the different cities that are independent of the business here. The business in Tacoma is proportionate.

PRESENT LAWS SHOULD BE ABOLISHED.

BY DAVE H. MORRIS,

EX-PRESIDENT AUTOMOBILE CLUB OF AMERICA.

A brief summing up of the present and future of the automobile, considered from its legal standpoint, makes legislation desirable that will result in the betterment of present conditions. The present law should be entirely abolished, and a new one substituted, of which the main provisions should be:

- (a) Driving to the common danger not allowed.
- (b) Elimination of all "miles per hour" prohibitions.
- (c) Penalties beginning with fines for first offenses, ending with suspended and revoked licenses, together with imprisonment.
- (d) Severe penalties for infraction of the law involving moral turpitude, such as receiving or demanding commissions, taking automobile without owner's consent, etc.
- (e) Annual license tax, the proceeds of which should be devoted to maintaining the new State roads.
- (f) Immediate review of any fine or penalty, by a superior act.

INDIANA FARMERS BUYING AUTOS.

FROM THE *INDIANA FARMER*, INDIANAPOLIS.

Editor "Indiana Farmer":

I am a reader of the "Farmer" and hear a great deal about the auto. I am a farmer and have ordered an auto; will have it by the first of March. Too many farmers always see the dark side of new improvements; some of them would howl if they were in heaven and St. Peter would give them a crown; they would ask for a better one. I think the auto has come to stay. I will admit there are some reckless auto drivers, but that is no reason you should condemn the machine. The law is in your favor; why don't you get after them? I know of several farmers in our neighborhood that expect to own autos in the near future. S. W.

This is as we predicted two or three years ago. Our well-to-do, ambitious farmers will own autos when the prices come down to hard pan; so it is well to be careful as to the laws we demand on the subject. Let them be just and reasonable; but farmers who are not able to buy, or do not care to own, autos have a right to demand that every precaution possible be made to protect their families from injury by them.

SOME PRACTICAL TYPES OF GARAGES

BY GEORGE RICE.

ALTHOUGH the modern private garage is quite an expensive institution, I notice that a great many of them are being built. The custom of keeping the automobile in a shed, or an apartment of an isolated barn, or under some leaky roof of an outbuilding is fast being done away with. Automobiles cost too much, and too much depends upon the proper care of the same, to resort to poor building protection. Formerly the

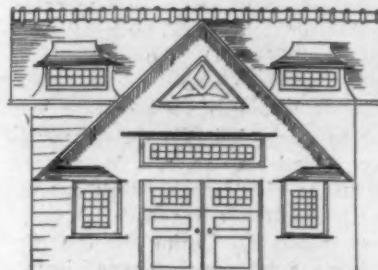


FIG. 1.—Stable front altered for transformation into a garage.

gins almost immediately. I have seen the ignition system of high grade machines rendered non-effective after a week's exposure in a defective barn. Not infrequently no protection at all is obtainable, and the purchaser of the machine simply covers the same with a canvas. Then I have seen cases in which machines have been run into livery stables for temporary storage for want of better service. In fact, all kinds of ways have been utilized by machine owners for the care of their automobiles when not in use, some of which have proven to be quite disastrous to the car.

In this article we will refer to some of the modern types of edifices which are being designed for automobiles. It is by far the better way to first secure the storage. But, as before intimated, it is the custom for most enthusiasts to get the machine first and take chances on the rest. Perhaps the buyer owns a carriage shed or a stable, and he can put his newly purchased automobile in the same. But he finds that there are many facilities lacking.

The care of the modern automobile calls for equipments that are not needed in the care of common vehicles. Hence to utilize a building intended for other purposes is not always advantageous. Nevertheless, I have seen a number of stables altered over so as to make first-class garages, one of which is exhibited in Fig. 1. Much depends upon the character of the building. If there is an abundance of horse stall space, you can use these for other purposes and the stalls can come out. The harness room makes a first-class apartment in which to keep extra tires and various parts of the automobile, such as the extras of the mechanism, robes, rubber covers, etc. The first work involves the overhauling of the entire interior. You knock down your stalls and partitions which are liable to interfere with the arrangement of the automobile.

The two plans, Figs. 1 and 2, will demonstrate the arrangement. In this case, the windows and doors of the building were removed and the plain lights changed for the artistic description of sash with colored lights. This was done in the doors as

well as in the window sash. The exterior was painted an appropriate color, and quite a neat effect resulted.

The floor plan shows the arrangement of the automobiles. In order to give a place where the chauffeur can get below the machine and attend to any requirements there, a vat is made in the floor and the machine is run over this pit when an examination is necessary. The mechanic can get in the pit below with the electrical flash light or a common lantern and readily see the lower portion of the car. The floor is cemented. It is slightly elevated in which the machine is washed with a hose and nozzle, and the edges are grooved so as to carry off the water. There is a workshop over in one corner of the place, and no garage should be without one. There should be a vise, a work bench, taps and thread-cutting dies, drills, wrenches and the usual supply of tools and devices for doing work on the cars when necessary. It is a good plan to carry a small assortment of bolts, nuts, set screws, washers, lag screws, etc. You will, of course, have your kit of tire lacing devices.

The stairs at the rear of the store room lead to the rooms of the chauffeur above. Here you put in some furniture and make your man comfortable, and he will be



FIG. 3.—Front of brick and stone garage.

more likely to look out for the machine well. He ought to have his bath, toilet, and other modern conveniences. As a rule the chauffeur will do most of the work about the machine and keep his apartments in order. I notice that some of the rich people have a helper for the chauffeur. He is usually a lad at low wages. Some people who run one or more machines go even further and have a mechanical man. But this is going rather deep into the game. A good chauffeur can attend to most of it. He may have to discard his brass-buttoned suit and get into overalls occasionally to wash the car, but this will not hurt him any. Of course, some people prefer brick or stone buildings for keeping their automobiles. Fig. 3 is a type of brick and stone building which impressed the writer. Buildings of this nature are preferable for districts in which a fireproof structure is needed. The middle door is for the entrance of the machines, and there is room enough on either side of the interior for a large car. The building is deep enough to warrant partitioning off for shop, extra part room, etc. There are the upper rooms for the chauffeur and general purposes.

A building of lighter construction, and cheap, is shown in Fig. 4. It is not desirable to have a building too much like a barn. Still, the plain edifice answers all purposes. Of the buildings referred, the values of each vary considerably. The brick building is, of course, the most costly. It would cost nearly \$3,000 to get a structure made of this nature, while an investment of \$400 will give you a building like that in Fig. 4. For about \$1,000 you can put up a first rate building of the

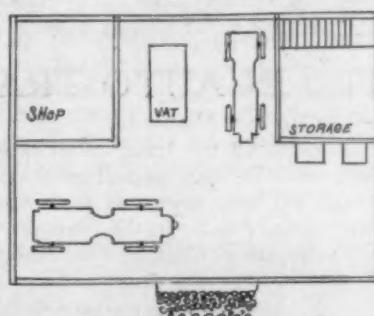


FIG. 2.—Floor plan arrangement for the autos and their appurtenances.

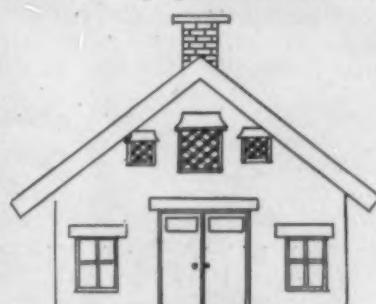


FIG. 4.—Small garage costing about \$400.

plan presented in Figs. 1 and 2. The best way is to get builders to figure on the structure. You can present sketches of what you desire and specify the details if desired. The contractors will do the rest, and save a lot of trouble for you.

Regardless of this, I know of a number of noted automobilists who have planned and erected the garage themselves. They made the drawings, selected the land, engaged the masons to put in the foundation, purchased the lumber and furnishings and watched every detail of the erection of the building from the basement up. Some men delight in doing this. But the average automobile enthusiast finds it better to turn the whole thing over to the experienced contractor, and let him do the planning and the thinking, at so much for the building complete.

AUTOS BECOMING NUMEROUS IN EGYPT.

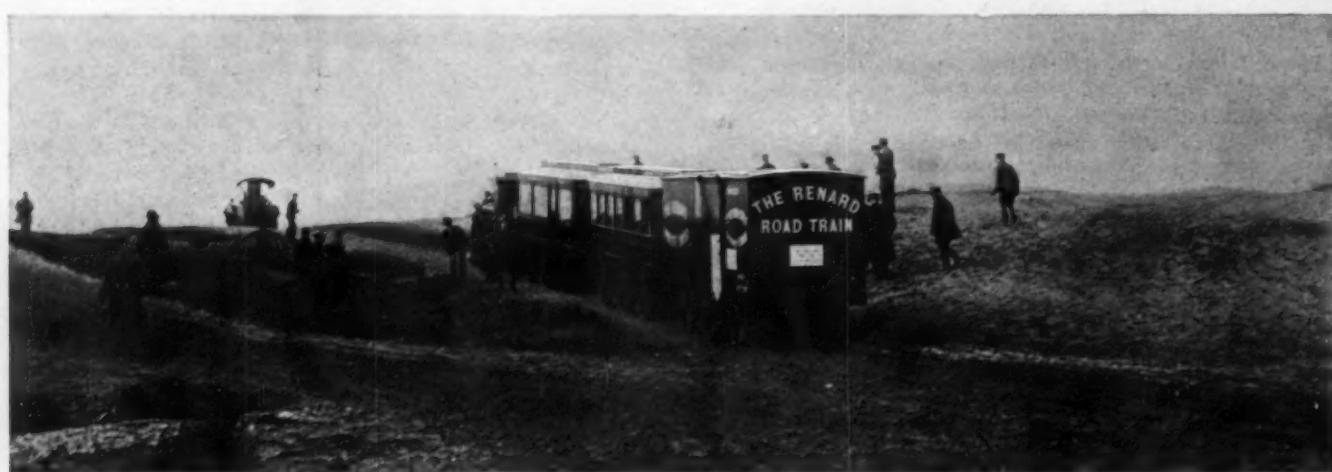
U. S. Consul-General L. M. Iddings, of Cairo, transmits the following report on automobiles in Egypt:

The number of automobiles in Egypt this winter has greatly increased over those of last year. Machines registered in Cairo now number 264; last season, 75; in Alexandria, 127, as compared with 120 last season. In Cairo one or two new garages have been built. Most of the cars owned by residents are French,

but the tourists have brought in all kinds. The opinion of everybody is in favor of cheap cars, which have a closed-in top and are of small horsepower. There are no hills to climb. Roads for police service in the Eastern Desert are in construction by the mining department of the ministry of finance.

The road from Edfou to Beza has been completed, and consists of an excellent track 90 miles long. From Beza it will branch to the south and north. The southern line will go through the emerald fields, while the northern branch will join the Keneh-Cosseir road from the Nile Valley to the Red Sea. Keneh is another base for a road northward. This road is now building along the old Roman way, which was constructed in order to bring the property from the Red Sea coast to the Nile, where it was floated down the river to be sent to Rome. This road, as at present planned, is to end at Ghattar, which is 90 miles from Keneh, and is half-way to Gebel Zeit.

The Edfou-Beza road has been largely used for motoring, and the new type of motors, which have been built for the use of the department of mines, has been found satisfactory. Motors are a far less costly and difficult means of conveyance than camels. The longest day's run in the Eastern Desert was made last mid-summer, when 148 miles were traversed. During the last trip of the mining department's tricar 243 miles were accomplished.



FRENCH RENARD SIX-WHEEL AUTO TRAIN DEMONSTRATING ON ALDERSHOT PLAIN BEFORE BRITISH ARMY OFFICERS.

WAR OFFICERS INTERESTED IN AUTO TRAIN

LONDON, March 2.—The British War Office is at present paying much attention to the improvement of its transport service and experimenting with various kinds of tractors for cross-country work. Particular attention has recently been paid to the Renard train, the invention of the late Colonel Renard, a noted French engineer. The idea is not by any means new, for Renard died near Paris nearly two years ago, and at that time his train was a familiar sight on the highways in the neighborhood of the French capital. It is the first time, however, that it has been seen in this country, and its appearance has caused considerable interest among army officials and public transport companies. Briefly, the train consists of a tractor and a series of six-wheel coaches, each one of which has a pair of driving wheels and two pairs of steering wheels. In France various tractors were used for drawing the train, among them being a Serpollet steamer, a Darracq engine and a Panhard. For the British experiments a 75-horsepower Filtz four-cylinder gasoline automobile was employed. Power is transmitted from the motor at the head of the train to a countershaft on the car immediately behind it, the drive being through side chains to the center pair of wheels. The propeller shaft is extended to the rear of the car and connected by means of a universal joint to the shaft of the following car, continued thus throughout the

entire length of the train. For steering the front and rear wheels, turn at equal angles but in opposite directions, and in precisely the same degree as the wheels of the motor car and other trailers ahead. In the trials the train was made to make some very erratic turns, and in every case was entirely satisfactory, the rear wheels of the last wagon traveling to within an inch or two in the same track as the motor. With a train of four long coaches, altogether 73 feet in length, a circle of 29 feet diameter was described. Afterwards the same performance was gone through in a reverse direction, a man simply guiding the rear wheels of the last coach. Further experiments were made at Aldershot before a number of English military experts, the train being especially tested in its ability to accomplish cross-country runs. These tests showed that the train would be of considerable value in carrying ammunition and stores to the fighting line. Sixteen Renard trains are now in use in different parts of the world; their manufacture will shortly be undertaken in England by the Daimler Motor Company, Ltd. It is expected that they will prove of considerable service as feeders for existing railroad lines; carrying market produce and passengers from outlying districts to centers of distribution. The somewhat arbitrary auto laws of this country offer no objections to the circulation of these trains.



CUTTING WOOD INTO BLOCKS FOR SPOKES.



ROUGH SHAPING THE BLOCKS TO BECOME SPOKES.

MAKING WHEELS FOR AUTOS.

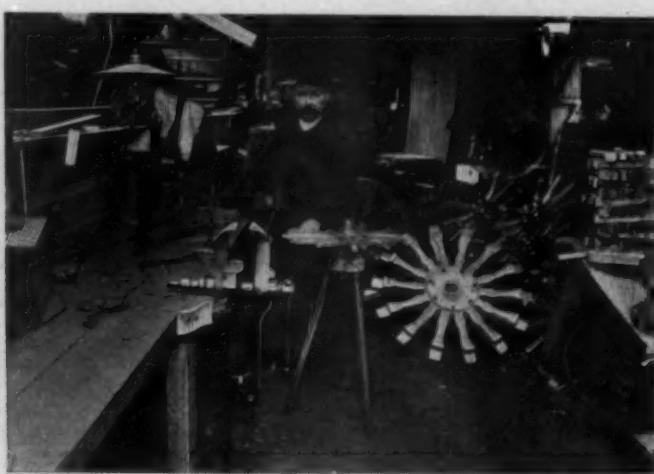
There is nothing of a complicated nature in an automobile road wheel; it has a metal hub in which are assembled wooden spokes, maintained at their extremity by a wooden band, encircled by a metal rim with special flanges for holding the pneumatic tire in position. Simple as is the product, the construction of an automobile wheel is a matter requiring highly skilled labor, the finest materials, special machinery, and the co-operation of a number of specialists. The illustrations on this and the following page show the upgrowth of an automobile wheel from the time the wood enters the factory to the moment when it leaves the works to be operated on by the painter and the tire expert. Whether it be the slender wheel of the ubiquitous runabout, a ponderous truck wheel with its iron band, or the touring car wheel, to be equipped with costly pneumatics, the process of construction is practically the same.

Suitable blocks of well seasoned wood are cut up to the length of the spokes by means of a band saw. Each block of wood has its end shaped by a special machine, forming a miter and tenon to suit the style of hub in which they will later be assembled. A moulding machine next plays an important part in the growth of the wheel. One by one the blocks are placed in the machine, the workman operates his lever, the circular plane comes into operation, and a few seconds later the block has assumed the familiar shape of a spoke. Up to this point there has been very little hand labor, yet it is necessary for the workman to have a vigilant eye and throw out any spoke which shows the least defect.

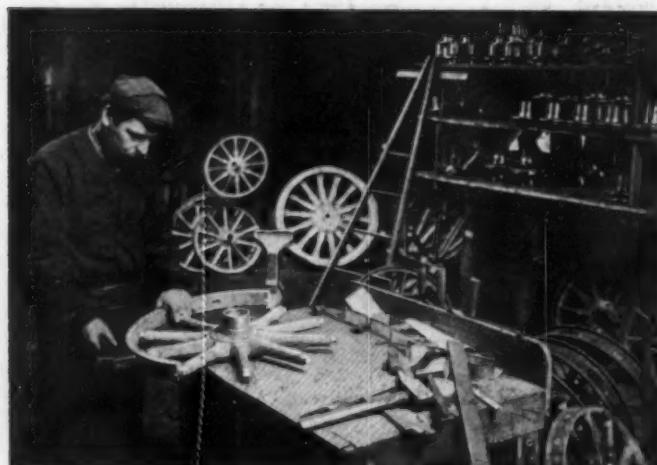
Passing to another workshop the finished spokes are assembled in a metal hub. The style of hub and methods of assembling differ considerably in the various factories. In the illustration herewith, which shows a heavy wheel intended for an omnibus, the spokes have been driven home by means of a mallet. The felloe has now to be fixed in position, and for this operation the spokes and hub are moved on to another workshop where a specialist takes them in hand. The felloe consists of two half circles previously bent into shape by a steam process. When the two halves have been placed over the ends of the spokes, secured and adjusted, the wheel is formed. As, however, it is impossible to allow the bare wooden rim to come in contact with the road, it is passed on to another department, where an iron band is made to encircle the wooden rim, giving additional strength, providing a running surface if the wheel is of the solid tire type, and an appliance for holding the pneumatic in position if it is of the rubber shod variety. This last operation is not the simplest of the many processes through which the wheel passes before it is fit to carry a flyer at a fifty-mile clip. The workmen engaged in this operation must be trained to work together, and must give full attention to the old adage "strike while the iron is hot." The metal rim is brought to a red heat in a special furnace, seized by three workmen armed with long gripping tools, and rapidly placed over the wooden wheel and driven into position with a few vigorous blows. For this operation the wheel has been placed in a kind of cast iron vat, plainly shown in the illustration. Immediately the rim is placed a few buckets of water are thrown over the wheel, the metal band contracts as it cools, binding all more tightly together.



FINISHED SPOKE LEAVING AN AMERICAN MACHINE.



ASSEMBLING THE SPOKES IN THE HUB.



PLACING WOOD RIM IN POSITION ON SPOKES.

The method of manufacture just described in that employed in one of the largest French wheel factories, the firm of Vinet & Boulogne, at Neuilly near Paris. The photographs were also taken in these works. This factory is one which first produced the dismountable rims which made such a revolution in last year's auto racing. Some of the rims will be noted in the engravings. In connection with wheel construction it is interesting to note that a large number of American machine tools are employed. The sturdy sabot-shod Frenchman shown operating at the foot of the preceding page has a lathe from the Defiance Machine Works, Defiance, O. In all the larger French wheel factories American tools are extensively employed, the products of such firms as Buckeye Wheel Company, Galion, O., House's Cold Tire Setter Company, St. Louis, being as familiar as the national article.

Such, in general language, and with an avoidance of technicalities, is the process by which an automobile wheel is built up. There naturally remain a number of finishing processes, but the wheel is practically complete as a wheel when the metal rim has been fixed. When it is remembered to what strains the wheels of an automobile are subjected from rough roads, lateral blows, skidding, and hard knocks against foot paths and banks, the necessity of the best of material and the most skilled workmanship will be apparent to all.

The proposal to erect a monument to the late Léon Serpollet on one of the public squares of Paris has met with hearty support in French automobile circles. Although only opened a few days ago, the subscription list has already reached the sum of 21,312 francs 20c.—about \$4,262.



DRIVING METAL RIM ON OMNIBUS WHEEL.

TWELVE HUNDRED DARRACQ CABS READY.

PARIS, March 4.—The first of the big series of motor cabs which several French manufacturers are constructing is now approaching completion at the new Darracq factory, near Paris. The Darracq machines, 1,200 in number, will be placed on the streets of different world's capitals, 500 going to London, 300 to Paris, 150 to Berlin, 100 to Vienna and 100 to Bombay. Two models are being constructed, one a two-cylinder 12-horsepower, the other a four-cylinder 18-horsepower. Characteristics are pressed steel frame narrowed in front, cylinders cast in pairs, 90 by 120 bore and stroke, mechanical valves, high-tension magneto, spray carburetor with automatic air inlet, high-tension magneto, tank and radiator combined, with high speed fan and thermo-syphon water circulation. There are three speeds forward and reverse operated by one lever under steering wheel, leather-faced cone clutch, internal expanding brakes, equal wheels 810 by 90, shaft drive, pan under frame. The weight of the two-cylinder model is about 2,090 pounds. The four-cylinder model may have either thermo-syphon or pump circulation, will have larger wheels, a longer wheelbase, and will weigh about 2,200 pounds. All the Darracq cab models will be fitted with landauet bodies built by Vedrine, of Paris, and will be shipped complete. The new factory only began work at the end of last year, but the first complete series is expected to be delivered by the end of May. The total output of automobile cabs from the Darracq factory alone will be 2,500 per annum. When it is remembered that other firms, among them Bayard-Clement, Renault, C. G. V., and Umic are prepared to do business on an almost equally gigantic scale, it is not an exaggeration to predict the abolition of the cab horse at an early date. The sudden growth of this branch of automobiling has taken French body builders by surprise, few of them being able to turn out their product to keep pace with the chassis. A temporary delay is likely to be experienced on this account. Some of the best French body makers, foremost among them being Vedrine, have realized the immense importance of this trade and have commenced the erection of large factories for the construction of automobile cab bodies in series. So far as can be gathered, no definite arrangements have yet been made for the placing of French automobile taximeter cabs in New York.

FRANCE HAS THREE UTILITY CONTESTS.

PARIS, March 4.—The Automobile Club of France has approved the scheme of the Marquis de Dion to organize a touring and speed contest this summer. The event will consist of a 1,000-mile touring competition for machines weighing 3,630 pounds, with four passengers on board, but without tires, spare parts, tools or gasoline. An average speed of 24.8 miles an hour must be maintained throughout the tour, with a gasoline allowance of either 3.9 or 4.4 gallons per 62.1 miles. It has not yet been decided which fuel allowance will be adopted; the committee are in favor of the larger, but several competitors think that the smaller allowance would be ample. Machines qualifying in the thousand-mile tour must compete in a 248-mile speed test over a fast course near Trouville. The tour, to be known as the Criterium de France, will be held from August 2 to 6; the race, entitled the Press Cup, will probably be held on August 7. Teams of three may be entered by any firm at a cost of \$500 per car up to May 1. After this date and up to July 1 the fee will be increased 50 per cent. for every period of six days.

The date of the French industrial vehicle competition and small touring car test has been fixed from May 20 to June 10, thus occupying 20 days. Five types of industrial vehicles are provided for, from light delivery vehicles carrying not more than half a ton, to heavy wagons taking a load of t. The small touring-car competition is intended to provide for doctors' automobiles. All machines must be run on alcohol of 50 per cent. grade. They must carry two passengers, travel at an average speed of not less than 9 nor more than 18 miles an hour, and have total weight proportionate to cylinder area.

LETTERS INTERESTING AND INSTRUCTIVE

Important Laws in Pneumatics and Hydraulics.

Editor THE AUTOMOBILE:

[630.]—Being a reader of your paper, I wish you would answer my questions in the columns of your next issue: (1) State three important laws of pneumatics and explain an application of each to automobile engineering. (2) State three important laws of hydraulics and explain an application of each to automobile engineering. (3) In what way do cam mechanisms permit of results otherwise unattainable by mechanical means?

Erie, Pa.

CHARLES SCHOLZ.

If it will be of any real help to you, we are glad to answer your questions, though we note that these questions are those used in the courses of a well-known correspondence school, of which we assume you are a student, for which reason we are not altogether able to see why you should ask us instead of the school for the desired information. Three important laws of pneumatics are involved in the heating of gases by compression, in the cooling of gases by expansion, and in the expanding of gases by heating. In automobile engines, when the charges are compressed, they are heated thereby, and when they expand from the heating effect of their combustion they cool, while at the same time developing the power. An important law of hydraulics is involved in the fact that liquids are practically incompressible, another is involved in the fact that connected bodies of liquids have surfaces normally standing at the same level, and a third is the law of capillary attraction. In any forced-feed lubricating system a given movement of the pump plunger positively injects a corresponding amount of lubricant to the bearing, which is an application of the first law. The second law finds an illustration in any float-feed carburetor, in which the height of the fuel within the atomizing nozzle bears a fixed relation to the height of that within the float chamber. The third law also is illustrated by the float-feed carburetor, in that it causes the fuel in the atomizing nozzle to stand rather higher than it would if governed solely by the second of the laws enumerated. The way in which cam mechanisms permit results otherwise unobtainable by mechanical means is that they afford a variety of possible forms of movement which is practically infinite, which is not to be said of any other single device.

A Peculiar Trouble.

Editor THE AUTOMOBILE:

[631.]—I have read with interest the letter in one of your recent issues from Jas. J. Thomas, Jr., since I have experienced something like the same trouble with the lubrication of my six-cylinder Ford car. The evidence of the trouble is that, with proper adjustment of the oil feed, the spark plugs of the first three cylinders must be cleaned very often, the fourth less, the fifth still less, and the sixth practically never. The spark plugs of the last cylinder are always dry and clean, in fact, but I have never had any trouble with overheating, scoring of cylinders, or seizing of pistons. I am sure that the oil is of the proper quality. There are no hills in this section of the country, the roads being perfectly level. The level of the oil in the crankcase was determined after careful experimenting with it at different levels. Any information you can give me will be greatly appreciated.

W. M. ROYSTER.

Norfolk, Va.

It seems to us that the best way of securing satisfactory advice in a difficulty like the foregoing is to communicate directly with the manufacturer of the car. Are you sure, for instance, that you are using an oil approved by the Ford people? Of course, it seems rather singular that the fouling of plugs should progressively increase from the rear to the front cylinders, though this in itself is hardly a serious matter, inasmuch as any spark plugs are fairly certain to become fouled occasionally, under certain conditions. Possibly the manner in which lubrication is effected has something to do with the difference. Usually fouled plugs may be taken as an indication of over-lubrication, though adjusting the oiling should correct this if it exists.

V. L.

Electric Lamps for Automobile Lighting.

Editor THE AUTOMOBILE:

[632.]—There are a number of things I would like to know about electric lights for automobiles, and I trust you can furnish me with the desired information. First, it appears to me that the storage battery is the most satisfactory source of current, since a dynamo is difficult to regulate, and, besides, cannot furnish power when the engine is not running. Second, in view of these conditions, it is desirable that the greatest light with the lowest current consumption be secured, making it an object to utilize something more efficient than the ordinary incandescent lamp. And, third, if the objects stated could be realized, electric lighting would be much more satisfactory and efficient than the acetylene systems now in vogue. What is the reason that the Nernst lamp, or the new tantalum, tungsten, and osmium lamps cannot be used, with the result of securing much better efficiency of illumination than so far has been found possible?

CHESTER K. SCOTT.
Topeka, Kan.

It is altogether possible that the future may bring some improvement along the lines you suggest, but at the present time there is little to indicate that success awaits their first trial. The Nernst lamp, in its present most successful forms, requires current at a voltage too high to be supplied without more storage cells than would be regarded as convenient on the ordinary gasoline car. And the filament of the Nernst lamp is of a mechanical strength scarcely sufficient to withstand the jolting to which it would be subjected on a car. The other new lamps you mention—those of the incandescent type, with filaments of certain of the rare metals—are scarcely tested to the point of thorough success, even in general applications to commercial lighting, so their possible value in automobile service is altogether an unknown quantity. The tantalum lamps, especially, probably suffer injury from jarring.

The Combustion of Compressed Mixtures.

Editor THE AUTOMOBILE:

[633.]—Can you refer me to some book or article on the subject of automobile engineering from which I can secure data concerning the action of mixtures fired under pressure? What I particularly desire to learn is the rate of flame propagation and the amount of pressure rise in different mixtures ignited at different pressures.

Portland, Ore.

ALFRED ROGERS.

What we must confess as an absolute inability to give a satisfactory answer to your question constitutes one of the many startling evidences that exist to prove the developing status of gas engineering. So far as we know, if any tests of the sort you specify ever have been made, the data secured from them has not been made public. A number of years ago, Dugald Clerk, the well-known English engineer, made some rather elaborate tests with gas mixtures at atmospheric pressure, while at the Massachusetts Institute of Technology some similar tests were made. From the meager facts thus made available all of the stock theories of desirable mixture proportions are derived, despite the fact that very little is known concerning the action of mixtures under pressure. If any one who reads this can give more information on this interesting subject, the columns of THE AUTOMOBILE are open to it.

More About Fording Deep Streams.

Editor THE AUTOMOBILE:

[634.]—Taking up question No. 606, would like to ask why he could not ford streams if he should have intake pipes made to his carburetor so they would rise above or even with the commutator.

Providence, R. I.

W. W. GRANT.

Merely raising the intake piping above the water-level would not prevent water entering the carburetor and putting it out of commission, but the carburetor entire might be placed above the cylinders instead of down at the side as is ordinarily the case. However, the answer to the question

was based on the assumption that no changes of any kind were to be made in the car, as the query was not what could be done to the car to make fording deep streams possible, but rather how to ford them when the carburetor is under water. Placing the carburetor where it would not be submerged would, of course, constitute a remedy for the difficulty, but it might also involve changing the system of fuel feed, as where gravity is employed, or the installation of an auxiliary feed for use under such circumstances, with the engine hermetically sealed and outlets provided, it would run under water.

MORE ABOUT DAIMLER AND THE TWO-CYCLE.

Editor THE AUTOMOBILE:

[635.]—I notice in the issue of February 21 the comments of T. J. Fay, in reference to what I said about the Daimler gas engine, which remarks seem for some reason to have made him quite sore, so much so that he seems to have lost sight altogether of the question that gave cause for the statement.

What I said of the Daimler design was true, and if it was not, Mr. Fay is not doing anything to show that it is not. Generalities about Daimler's pioneer work prove nothing. If I remember right, Brayton used liquid fuel long before Daimler did, but being hampered for means, failed to make as much of a success as his originality and talents deserved, which was far from being the reason why Daimler did not make a greater success of his. I think that I am safe in assuming that if Brayton had had the backing that Daimler had, gas engines would have been developed to a higher stage of perfection long before they were. A man's achievements have to be judged largely by his opportunities.

I still maintain that Daimler's construction was not so perfect as to justify referring to it as a precedent, justifying any kind of a design, as though that settled the question that Daimler's construction was above criticism. As I understand it, the only point at issue is whether my criticism of two-cycle engines that admit the charge into the cylinder through a checkvalve in the piston head, the piston head being the valve seat, was warranted by the facts of the case, which I think was fully answered in the reply, from which Mr. Fay is quoting, and to which he so much objects.

It seems to me that it is much better to base arguments as to the efficiency, or inefficiency, of any construction upon the reasonableness of the thing, rather than on precedent of some "has been" construction. The theory and practice of gas engine construction is being constantly revised; for instance, no longer ago than when Daimler made his first gas engine the almost universal practice was to leave one-third of the cubic capacity of the cylinder for compression space; now everybody believes in high compression, and it would seem absurd for anyone to try to prove that low compression was the best because Daimler's engines were low compression; I think that it is equally absurd to try to prove the efficiency of any other construction by holding up Daimler as an argument.

I am very glad to know that Mr. Fay is going to build a two-cycle engine, and wish him every success, and from his remarks about Mr. Lougheed's opinions, I infer that he intends not to follow the beaten path, but bring out something original. If I am right in my surmises, he might read over some of my writings which were recently published in "The Automobile"; the ones that I refer to were published in the issues of December 27, 1906, the other January 3, of this year. If, however, he intends to build the up-to-date standard two-cycle type, he would do well to read the articles published in "The Automobile" in the earlier part of the fall of 1906.

Unless he has had a wide experience in designing two-cycle engines, it will be worth his while to read over all of these papers, and see just what progress has been made in bringing the two-cycle up to "be somebody." I am under the impression that he has not quite kept up to the advancement that the two-cycle has already made. For myself, I have unbounded faith that the two-cycle will soon be the gas engine for every purpose where the greatest power, with the least weight, least complication of parts, are matters of any importance, and although there are no two-cycle engines yet on the market that fulfill my ideal as to some of the requirements, yet to-day it will develop more power than a four-cycle, size for size, and by some manufacturers and users of automobiles is preferred to the four-cycle. Come to think of it, it was perfectly natural that the four-cycle should be perfected first, before there should be much progress in perfecting the other, for that is the natural order of evolution, from the more complicated type toward simplicity. We welcome Mr. Fay to the ranks of two-cycle designers, and will all wait with breathless interest while he solves the problem of the perfect two-cycle gas engine.

C. P. MALCOLM.

Detroit, Mich.

CAN ANYONE CLEAR UP THIS MYSTERY?

Editor THE AUTOMOBILE:

[636.]—The writer would like to have you or some of your numerous readers explain if possible through your "Letters Interesting and Instructive" the following phenomena.

When at the end of last season's use my car was put away for the winter the lamps and generator were removed, leaving the rubber gas tubing which attached the copper tubing to the lamp and generator hanging loose and the ends of same open. A short time ago, when overhauling the car, parts of the copper tubing were found slightly bent in places, and upon taking the copper tubing in my hands to straighten these bends was very much surprised to hear, as soon as the bending was started, a considerable explosion and see flames shoot out the ends of these tubes. The explosion was nearly as loud as a pistol discharge, and of sufficient force to tear loose the section of rubber dangling on the ends and blow same across the garage, a distance of twenty or thirty feet.

There was no fire or open light to ignite any gas that may have remained in this tube during these weeks of idleness, and as can be well imagined the writer was very considerably surprised. On bending the other copper tube leading to the other lamp the explosion was repeated in exactly the same manner, and it seems quite improbable that the slight bending of the tube could create enough frictional heat to ignite a gas that might have remained in these tubes.

This is a new experience for myself, and if anyone can and will throw some light upon the cause of such explosion, would gladly have them do so through your valuable publication.

Schenectady, N. Y.

B. A. BURTISS.

A COMBINATION COOLING SYSTEM MOTOR.

Editor THE AUTOMOBILE:

[637.]—Relative to letter No. 588 in February 21 issue of "The Automobile," by "A Subscriber," I would infer that the question has reference to a combination air and water cooling system, in

the nature of an interchangeable system, using either air or water without the changing of cylinders, it being understood that most of the motors in present use are on this order, as the heat must be extracted from the water by the air.

For your information, as well as for that of your subscriber, I would say that I have an engine, constructed upon the lines referred to, which has an increased cooling capacity for either air or water, with less weight to the cylinders in accomplishing the result; with a removable water jacket and an improved system of air flanges, all of which go to make an interchangeable cooling system. For your assistance on the subject, I submit here-with drawings of engine. If any other information regarding its

advantages are desired, I will be pleased to furnish you with any details you wish; or should any of your readers wish to have the working of this system explained more at length, will do so.

Rutland, Ill.

C. G. SHEPHERD.

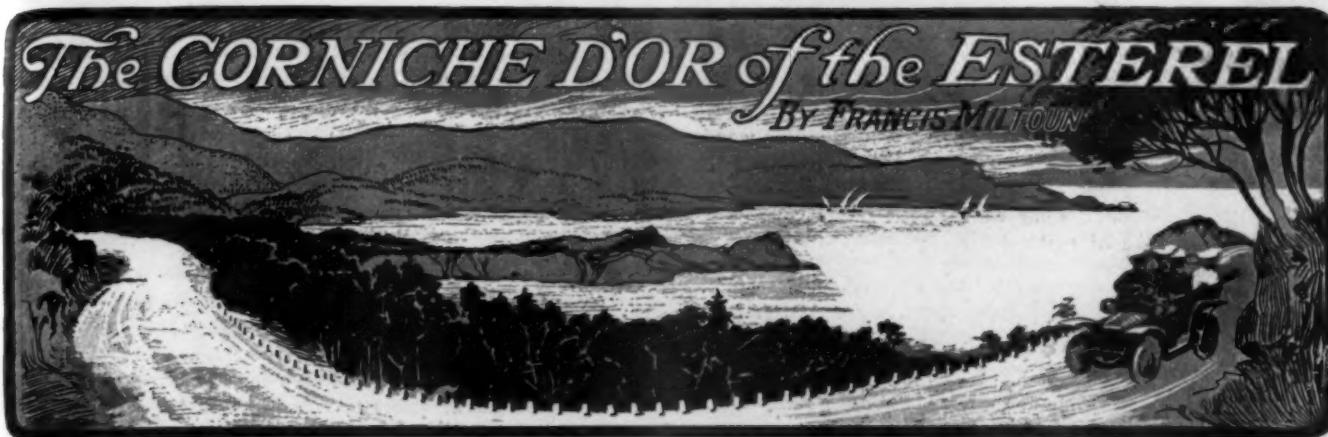
PRESS THE BUTTON AND LIGHT THE LAMPS.

Editor THE AUTOMOBILE:

[638.]—In your issue of February 21, under "Letters Interesting and Instructive," there is one, No. 583, signed W. L. K., relative to an appliance for lighting headlights by pressing a button. Would say that we have at the present time in operation a contrivance of this sort for lighting gas lamps which uses a jump spark and lights the lamps by pressing a button close to the seat of the car.

Amesbury, Mass.

GRAY & DAVIS.



ENTIRELY due in the first instance to the Touring Club de France, a great national road has been laid out in recent years along the edge of the Estérel range of mountains and the blue waters of the Mediterranean.

Not every Riviera tourist knows the wonderful region of the Estérel as well as he ought, and not every automobilist to the south of France passes by this new-laid-out "corniche"—the peer even of the more famous "corniche" between Nice and Monte Carlo—preferring to go by the old road, the Route d'Italie—to the north of Mont Vinaigre, the culminating peak of the Estérel, 2,000 feet in height and a dozen or more kilometers from the shore. This is all wrong. One should no more make the Riviera tour en automobile and miss this forty kilometers of the most superbly situated and ingeniously engineered roadway, perhaps, in all the world, than he should attempt to lunch en tour on a ham sandwich and a bottle of Vichy, as more than one scorching automobilist who was trying to tour Europe in ten days has done before now.

All Riviera tourists, and some others, know that the Estérel is a great curtain of reddish-brown porphyry rock which comes down to the Mediterranean just westward of Cannes and shelters that "ville d'aristocratic anglais," as the French call it, from the icy breath of the mistral of the Rhône valley. This much they know but not much else; they take their cue from what they remember of Lord Brougham's pilgrimage three-quarters of a century ago and think that there is nothing worth seeing on the Mediterranean coast west of Cannes, forgetting for the moment that the city of Fréjus spurned the offer of England's Chancellor to make it a winter rest-house for the noblesse of "brumeuse Angleterre." Perhaps the city fathers were wise to have rejected the proposition. Who knows?

Gateway to the New-Made Corniche.

At any rate, Fréjus is the gateway to the new-made "corniche" and is a dead, dull town with nothing at all of the life and conventional pleasures of the real Riviera. The Hotel du Midi at Fréjus is the last inn of its class to be found on the Riviera as one goes east. It is modest, frankly commercial, and you will have difficulty in spending more than nine francs a day for your food and lodging.

The Estérel range itself is to a great extent a vast dominial forest peopled largely by that species of evergreen pine known as the *pin maritime*. The forestry department of the Government

here steps in and has its say and tells you when you may and when you may not cut down trees, and where you may cut a path and where you may not, so that there has been considerable method in the laying out and opening up of this hitherto virgin fastness. Since 1891, only, have any but the inhabitants of the neighborhood ever explored this mountain wildwood which the French fondly compare to "le Yellowstone," but to-day there are 240 kilometers of forest roadway of which considerably more than half is practicable for automobile traffic.

That Radiator Repair Worth Remembering.

All the same there is a savagery about the interior of the Estérel which on occasion can offer something in the way of adventure, as for instance it once did in the writer's case. We were stalled in a grim, stony defile while the water had all trickled out of our radiator, or rather the hose-pipe connection had itself, in some way, mysteriously disappeared, *tout entière*. There was nothing for it but a twelve-kilometer walk over and back to the Auberge des Adrets to see what the Poste de Secours, thoughtfully established by the Touring Club de France for the benefit of distressed cyclists and automobilists, might offer. It didn't offer us anything that would do us any good, but this might have been expected. There was all sorts of little things which would help out with a refractory nut or bolt; there was copper and iron wire and a whole tire repair outfit; besides which there was a good workable pump and a first aid to the injured box of medicines. All very thoughtful and a blessing to anyone who might want these things—for which you pay nothing; though, unless you are a dead beat, you donate something to the "cantonier" of the neighborhood who has the *boîte de secours* in his charge. We got a piece of hose-pipe finally from the garçon d'écuries at the auberge, and in spite of a three hours' delay took the road again none the worse off.

Four kilometers from Fréjus one passes through St. Raphael, unless, indeed, he wants to linger within the purlieus of this altogether delightful, unspoiled bit of the southland. In recent years it has grown to a population of 3,000 souls, and until one reaches La Napoule there is no such metropolis as this on the whole "corniche."

Boulouris, Agay and Antèore are not even names recognized by most Riviera tourists, but one and all are delightful, little new-found spots which have not yet been exploited to the death, even though they have become possessors of a



OLD-WORLD STOPPING PLACE IN THE MIDI.

hotel-restaurant or pretentious establishments bearing the title of "Grand Hotel."

The Estérel Not for Sordid Automobilists.

If any automobilist is of the mind to rush through this wonderland "all out," he had best stick to the northern road and leave the corniche to the true vagabonds who like to linger where fancy wills. The sordid souls who have taken up automobiling merely for the sake of rushing through space will be quite as content with a circular track as with this twisting, turning road of the Estérel, even though there are some of us who think differently. One day, or two, or three, spent in the Estérel will be time well-spent and the pleasure and delight that will accrue will be immeasurable.

To reach the interior mountain roads one's best point of depart is from Agay; otherwise it is better to keep on to La Napoule and enter from the north.

Corsica Can Be Seen, 200 Kilometers Away.

More than 200 kilometers distant, bedded on the cloudy fringe of the horizon, one may sometimes see—not always—the angular heights of the Corsican isle. Northward the view is as entrancing; far beyond the foot-hills upon which rise Grasse, Castellane, Puget-Théniers, and their sister-towns of the Alpes-Maritimes and



PICTURESQUE MOUNTAIN ROAD.

the Var, may yet be seen the snows of the southernmost of the Alpine peaks proper, many of them of a height of more than three kilometers straight skyward, the queen of them all being "La Punta Afgerera," rising to a height of almost 5,297 meters.

From Trayas to Theoule is fourteen kilometers of daringly built roadway, now passing over a deep-cut bay or *calanque* and now freeing the railway by a sky-scraping viaduct and once and again sweeping a curve around some rocky promontory on a shelf cut sheer in the rock itself.

Only Six Francs a Day!

Things begin well with the Corniche d'Or the minute one launches his automobile on the road leading out from Fréjus, but before Agay has been reached one has warmed to it so that his appreciation of the latter half of the journey will know no words to do it justice. Right at the edge of tide-water one follows the western shore of the Golfe de la Napoule over which poets and painters have raved as they have over Capri and its grotto. Everything but nature itself is as yet in embryo and the disturbing influences of civilization have not yet become so great as to mitigate one's pleasure. At Theoule the Hotel de l'Estérel has arrived, but its pension prices have been until recently—and are still if the patron has not gone the way of most of his degenerate confrères on the Riviera—but six francs a day. Think of this! Ye who sport around at Atlantic city, Old Point, and Tampa Bay at prices anything you like to pay.



BESIDE THE BLUE MEDITERRANEAN WATERS.
ON THE CORNICHE D'OR.



A VIEW OFF SHORE.

To avoid the five o'clock teas and "sportsmans" of La Napoule which comport so ill with the rare beauties of the Mediterranean littoral, it is well to keep the road a kilometer or so further and then turn abruptly to the left, leaving the coast behind. In a dozen kilometers or a little more, you will come to the Auberge des Adrets, a genuine unspoiled *logement* and not much more. To-morrow you can roll gently down into Cannes, "the ville of the Grand Ducs and the English aristocracy" and be as blasé as the rest of them, but stave it off for one more night anyway.

As Quiet as in the Days of Macaire.

There is nothing at the Auberge des Adrets to suggest modernity save the rushing by of an occasional automobile on the great "Route d'Italie" in the dead of night. For the rest it is as quiet and tranquil as it was in the days when Macaire and his fellows held up unsuspecting travelers by coach and chaise and relieved them of their all.

It is all very crude and rough here and you may get a bed for a franc and a *repas* of a primitive order for another franc—or more, if you choose to pay it. The wind sighing through the *chataigniers* will lull you to sleep and as you wake in the morning with the sun just tipping the summit of Mont Vinaigre you will be almost ready to give up automobiling and go back to the old days of the romantic *poste-chaise*. You won't seriously think of do-

ing this, of course, for we have become spoiled in recent generations, but the thought will occur to you nevertheless.

All this tranquillity and romantic idealism is within a dozen kilometers of the nerve-destroying distractions of Cannes, Nice and Monte Carlo, or at least the gateway thereto; where you become a frequenter, whether or no, of the Cercle Privé, of tea-shops, of alleged American bars or of Monte Carlo's game and restaurants who serve "les mutton chops" and "pal' ale."

Touring Club Helped Build the Estérel Road.

The Estérel road was planned and built by the combined efforts and expense of the French nation, the Départements of the Alpes-Maritimes and the Var, the Touring Club de France, and the P. L. M. railway. This latter seems somewhat of an anomaly—a railway contributing to build a stretch of roadway which shall be in direct competition with its own powers and functions—but it is a fact, nevertheless. As an engineering triumph the road must rank as one of the great works of its class of any age—and they were mighty good road-builders in France even in the days of the Romans.

For almost its entire length the road runs beside the *chemin de fer*, crossing ravines and gullies often on the same shelf of levelled rock. For the most part it is something over ten meters in width, but in places it narrows down to half this. There are no rises or descents which exceed 5 per cent., and when these one in twenty grades occur they are not very long.

THE COMING MOTOR BOAT RACES AT MONACO

In numerical value the great annual motor boat meeting to be held at Monaco April 1 to 16 surpasses all its immediate predecessors. When the entry list closed this week the International Sporting Club of Monaco, which organizes this meet, had enregistered a total of 90 boats in all classes. As is always the case in these meetings, a certain proportion of the entrants will fail to put in an appearance at the starting line, but with this allowance the number will be sensibly above that of last year's meeting, which united sixty-six actual starters.

As in previous years, the Monaco programme will consist of an open-air exhibition in the picturesque ground of the Condamine, with the bold cliff as a background and the blue waters of the Mediterranean in front. It is an ideal spot for an early spring sojourn, and it is no matter for wonder that the fortunate and elegant idlers of the wide world congregate in the neighborhood at this time of the year. Monaco is important as a society meet, but it is surpassed as a sporting enterprise. Three distinct classes of boats are provided—cruisers, racers and sea-going vedettes. Cruisers are divided into four classes, with a limited length and proportionate cylinder capacity, beginning with 20-foot boats having 21-2 liters cylinder area and proceeding by stages to comfortable, roomy cruisers of 60 feet over all and a 15 liter motor. Only two classes are provided for the racers, up to 26 feet over all and above 26 feet in length. The sea-going vedettes are a new class now being given considerable attention, with a view to their adoption in the fighting marine. The regulations stipulate that the length of these craft shall not be more than 25 feet, and total weight 2,640 pounds, all included except the motor and its piping. A number of these small rapid boats have been built for the French navy, to be used for vedette service in the home waters, but this is the first time that they have had a class provided for them in the Monaco meeting.

Monaco maintains its reputation for big prizes. The four classes of cruisers have \$5,800 in cash as their prize money, the two racing classes will compete for \$3,800, the vedettes have \$3,000 and the poorly represented hydroplane class can win \$600. In addition there are \$8,800 devoted to a number of handicap races for cruisers and racers, the championship of the sea, and the mile and kilometer records. Among the trophies are the Prince of Monaco's Cup and a magnificent work of art presented by M. Thomson, French Minister of Marine, for competition among the vedettes. With a grand total of \$22,000 in cash, it cannot be doubted that the competitors will win more than will cover their heavy expenses, while the advertising value of a series of victories will be worth no small amount. Unlike the big motor boat meetings in America, the Monaco tournament is a purely trade display. Even the cruisers are entered and run in most cases by either the hull maker or the engineer, or the two in

conjunction. The racers, though in a few cases piloted by wealthy sporting amateurs, are purely trade boats, as is indeed indicated by such titles as *Panhard-Tellier*, a Panhard motor in a Tellier hull; *Mercedes-Florio*, *Itala*, *Daimler*, *Antoinette*, etc. The same thing applies to the vedettes, the success of which in the races will doubtless largely influence their adoption by the naval authorities.

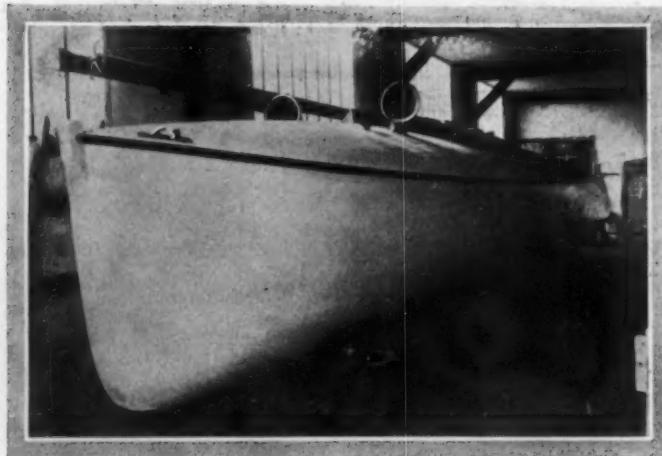
There has been a healthy development, but no radical changes in the cruisers. Earlier tendencies of the French to construct only light boats for river work are not now so pronounced, a number of the new boats being large, comfortable cabin craft, capable of facing a reasonable amount of rough weather. Two at least of the new cruisers use kerosene as fuel.

Racers are still the center of attraction, despite the prophesies that were issued of their speedy disappearance when early blunders brought upon them the witticism of the world. Though slightly decreased in numbers, they are, however, of greater interest than ever before. The utter disproportion between hull and motor, river-going hulls for sea service, and inadequate protection for the motor against flying spray and an occasional wave breaking on board have been largely remedied in this year's craft. Hulls were more at fault than the motors, with the result that few of the more powerful craft could be let out to full power for fear of a collapse. In the first series of racers there are but half a dozen boats all close to their 26 foot limit and all of considerable interest. *La Ra-*

prière II., the successor of the famous but unfortunate *Rapière* with which Tellier defeated all comers, will be watched with considerable interest. Panhard-Levassor is responsible for the engine work and Tellier & Gerard are the builders of the hull. The Antoinette Company, famous for its lightweight motors for flying machines and motor boats, presents a 24-cylinder motor in a boat bearing the name *Antoinette V*. The Itala firm has a 135-horsepower motor in a 26-foot hull christened the *Itala*. Fiat has engaged a fast boat bearing their name to be driven by an 8-cylinder engine. The most remarkable boat of the meeting is the *Mercedes-Florio*, owned by the well-known Italian sportsman, the Chevalier Florio and engined by the Mercedes firm. The hull is entirely of steel, 26 feet 4 inches long, 97 inches wide, drawing 7 inches of water. G. Pitre, the boat builder of Maisons-Laffitte, near Paris, has designed the hull on entirely new lines. The bow is of the form of a horseshoe, the sides are perfectly straight and the stern is squared, the object being to reduce surface friction to a minimum. The hull is divided into four compartments; forward is a water-tight compartment, next the open engine pit, protected by high combings and provided with a movable, water-tight hatch; a small cockpit for the pilot, containing two gasoline tanks, with a special arrangement by which the gasoline can be rapidly



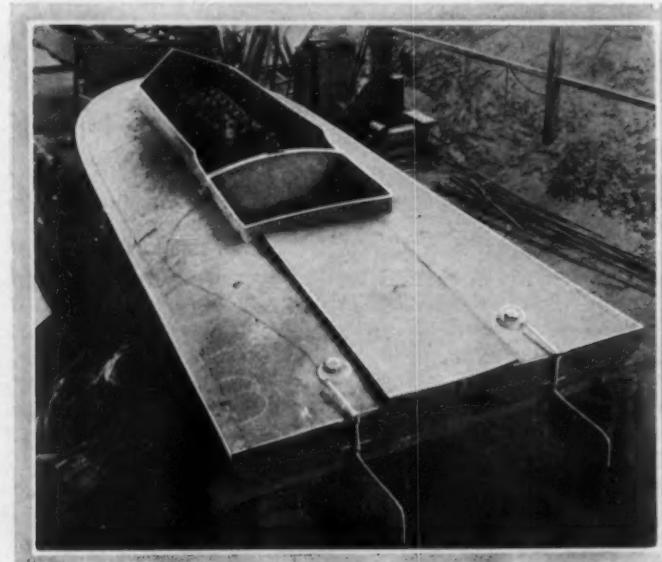
SPECIAL MERCEDES ENGINE IN FRENCH HULL FOR ITALIAN OWNER.



HENRY FOURNIER'S FAST CRUISER WITH ITALA ENGINE.

emptied into the sea in case of fire, and a large water-tight compartment astern. The craft is a marvelous piece of metal work, exceptional care having been taken in the rivetting of the thin plates to produce a light but very strong boat. The boat has two rudders. A special 6-cylinder 150-horsepower Mercedes motor supplies the motive power. Pitre expects to reach a speed of forty-five miles an hour with this original gliding boat.

The big racers over 26 feet in length comprise seven or eight entirely new boats and a small number of last year's racers. Brasier continues the *Trefle à Quatre* series with a *Trefle à Quatre II*, carrying a 4-cylinder 120-horsepower Brasier motor in a wooden hull. Henry Fournier will pilot a fast Itala boat of about the same horsepower; the Chevalier Florio will have an Itala motor in his big *Jeanette*; Panhard will engine the *Panhard-Tellier* and the *Paris*, the latter with a 135-horsepower Grand Prix type of motor, driving two propellers; Dietrich will have the *Lorraine-Dietrich*, equipped with a 130-horsepower motor of the type that was so successful in the Ardennes Circuit; *Mendelssohn IV*, is another powerful lightweight motor bearing the name of the maker of its engines; the *San-Giorgio* will defend the fame of the Italian firm of that name. The English, who have always been greater rivals of the Latin races on water than on land, present a strong trio in the *Daimler II* and *Daimler III*, both owned by Lord Howard de Walden and engined by Daimler of Coventry, and a craft built by Saunders for Lionel de Rothschild to be engined by Wolseley.



STERN VIEW OF MERCEDES-FLORIO GLIDING BOAT.

Despite the encouragement that has been given them, hydroplanes will not be well represented. It is probable indeed that the only starter will be the *Nautilus-Obus*, built by Deschamps & Blondeau and engined by Mutel. This curious craft consists of two floats, each 6 1-2 feet long by 6 1-2 feet wide, united by an ash framework stiffened by metal stays. The frame is 23 feet long by 23 inches wide. The total length is 28 feet and the total weight 1,210 pounds. The frame is fixed to the two floats by two axles and springs like those used on an automobile. On the foremost float is placed the 4-cylinder 55-horsepower motor, and on the other the pilot's seat, the gasoline tank and a steering wheel and column, as in an automobile.

A NOVEL FLOOR PLANING MACHINE.

Although American automobile manufacturers have not yet obtained much hold on the French automobile market, various kindred and tributary industries are better represented in the home of the auto than is generally imagined. The accompanying illustration shows an American motor floor-planing machine at work on the Velodrome d'Hiver cycle track in Paris. The machine, which is being demonstrated in Europe for an American manufacturer by O. L. Pickard, automatically planes a floor and



AMERICAN OPERATOR AND MACHINE PLANING PARIS TRACKS.

gathers up its own shavings. The Velodrome d'Hiver on which the experiment is being made is a very popular winter indoor cycle and motor cycle racing track, forming a part of the huge machinery hall of previous international exhibitions. There are about half a dozen of these cycle tracks in the French capital, most of them open only in summer; the one in question is closed in summer and open in winter. By this arrangement interest in track racing is kept alive all the year round. A sight of the crowds leaving the "Vel d'Hiv" any Sunday afternoon is sufficient proof that the sport has lost none of its old charm for the French.

THE AUTOMOBILE AS A MONEY EARNER.

Early holders of stock in the now world-famed automobile firms are reaping a rich reward as the result of their foresight, sagacity or luck. To take but a few of the best known French automobile concerns, Panhard & Levassor shares issued at 10,000 francs were quoted at 65,000 francs at the beginning of this year. In a recent commercial deal their value was fixed at 105,000 francs, or more than ten times par value. Darracq shares issued at 25 francs are now worth 75 francs. Dietrich shares with a nominal value of 500 francs are now quoted at 1,100 francs. Rochet-Schneider has passed from 500 to 3,000 francs. Richard-Brasier, C. G. V. and Krieger shares have increased in market value 150 to 500 per cent. Such tire houses as Michelin, Hutchinson and Bergougnan pay annual dividends of from 10 to 25 per cent. Congo Colonial Societies, whose chief product is rubber, have been phenomenally successful.

MOSTLY ABOUT THE EASTERN CLUBS

Recent Activities of the Busy Cleveland Club.

CLEVELAND, March 11.—The Cleveland Automobile Club is working out two new schemes of benefit to its members and to automobilists in general. One of these is the publication of a register of the numbers and names of automobile owners in Cleveland and vicinity, as well as the make of the car. The names will be given in alphabetical order in one section, while in another the list will be arranged according to the license numbers. The records will be brought up to date at frequent intervals. Another innovation is a registration bureau for chauffeurs. A large number of chauffeurs have already registered with Secretary Asa Goddard, and he has found positions for a number of good men with owners who will have new cars in the spring. No charge is made at this intelligence office, either to the chauffeur or to the employer; furthermore, Secretary Goddard does not recommend a man until he has assurance that the applicant is a skillful and careful driver and is familiar with the handling of any make of car. Mr. Goddard is co-operating along with the Y. M. C. A. automobile school in this work.

The recent automobile show greatly benefited the Cleveland Club. The club had a special reception room at the show, and as a result of the missionary work done at that time more than fifty new members have been secured. This is but one of the many evidences of the wonderful increase in the number of those interested in the automobile in Cleveland.

Secretary Goddard delivered an address at the opening of the Y. M. C. A. school's spring term. He spoke of the development of the automobile industry and its future and the kind of training men need in order to enter the work as shop employees or drivers. Mr. Goddard expressed the opinion that twenty years hence horses will be an unknown quantity in the streets of large cities and that motor vehicles will wholly supersede them.

Fuel Test Not Included in New Jersey Endurance Run.

NEWARK, N. J., March 9.—Economy in fuel consumption will not figure in the endurance contest of the New Jersey Automobile and Motor Club to be held on May 30, 31 and June 1. Owing to the difficulty of arriving at a basis satisfactory to touring machines and runabouts of different horsepower, it was finally decided to drop the fuel test entirely. The action does not meet with the approval of all contestants; for, owing to the especially good nature of the roads over which the run will be held, it is feared that a number will tie for the trophy. Strict adherence to the speed laws and a prompt arrival at the controls will now be the feature of the tour. A driving schedule will be fixed, any car arriving at the controls ahead of time will be fined two points for each minute, while late arrivals will cost the delinquent one point per minute. The trophies will be the Shanley cup for touring cars and the Sinclair cup for runabouts.

A. C. of Buffalo Will Listen to Mr. Glidden.

BUFFALO, N. Y., March 11.—Secretary D. H. Lewis, of the Automobile Club of Buffalo, announces that Charles J. Glidden, donor of the Glidden trophy, will deliver a lecture to the members of the club, March 22. The affair will be known as "Ladies' night." Concert Hall has been engaged for the occasion. Mr. Glidden's subject will be, "The World as Seen from a Motor Car." The lecture will be illustrated with stereopticon views.

At the recent meeting of the club twenty-five new members were elected. The membership of the local automobile club is increasing with such rapidity that it will soon be one of the largest automobile clubs in the world. There is a strong probability of more members being added in the near future.

Capital City Autoists Get a Speed Limit Doubled.

WASHINGTON, D. C., March 11.—Automobilists of Washington are delighted with the action taken last week by the town council of Glen Echo, Md., in amending the ordinance regulating the speed of automobiles within the corporate limits of that town by increasing the speed limit from six to twelve miles an hour. This gratifying action was the result of a recent conference between R. B. Caverly, president of the Automobile Club of Washington, and the Washington Automobile Protective Association; C. M. Fulton and W. S. Duvall, attorneys for the association, and John Garrett, mayor of Glen Echo.

This conference was held in Washington, and during its course the representatives of the automobilists admitted their defeat in their efforts to prove that the town of Glen Echo and Montgomery county had no jurisdiction over the Conduit road in criminal cases. They suggested that the town ordinance be amended so as to conform with the State law, which fixes the speed limit at twelve miles an hour. They also agreed to drop all the pending litigation. This was agreeable to the Glen Echo authorities and the necessary amendment to the town ordinance was thereupon made.

Motor Scooter Club of America Formally Organized.

NEW YORK CITY, March 11.—An addition was made to the calendar of national sporting clubs by the formation of the Motor Scooter Club of America at a meeting held at Madison Square Garden last week. This sport is becoming popular in the neighborhood of the Great South Bay, L. I., and many residents are showing their interest in these original craft since Nathaniel Roe showed how to rush over the ice surface at a speed that made the sail boats look sluggish. The unusual cold of the winter has enabled the devotees of the sport to enjoy it to the fullest extent, and the new club contemplates arranging a series of races next season. There will not be much active racing this winter owing to the fact that the ice on Great South Bay may break up at any time. The list of members includes many prominent Long Islanders and New Yorkers, among them being Harry Payne Whitney, August Belmont, W. K. Vanderbilt, Jr., Jefferson DeMont Thompson, A. R. Pardin-ton, E. R. Bellman, James L. Breeze, John Masury, Sidney Breeze, Judge Jaycock, William A. Franklyn, John Sylvester, H. H. Harrison, George Wilson and Ferdinand Rockwell.

Philadelphians Hold Annual Feast with Great Eclat.

PHILADELPHIA, March 11.—The annual banquet of the Automobile Club of Philadelphia, at the Manufacturers' Club, last Friday night, was chiefly remarkable for the rather broad hint given by Alfred T. Chambers of a coming resumption of amicable relations of the club with the A. A. A., and a return to the national fold of not only the Philadelphia organization, but of all the clubs composing the Pennsylvania Motor Federation as well. This statement, coming as it did on the heels of the recent action of the Quaker City Motor Club in appointing a committee to get in touch with the automobile clubs of the State, with a view of forming a State organization, assures, in the opinion of "those in the know," an early return of the secessionists to a place under the banner of the national organization. When Toastmaster Jacob J. Leeds introduced the Governor of the State, Edwin S. Stuart, there was a storm of applause. His Excellency paid a deserved compliment to the automobile when he stated that without it he might have been defeated. It had enabled him to attend as many as half a dozen meetings in a single night and to address thousands where, under other conditions, his auditors would have been numbered in the hundreds. He expressed himself as being heartily in favor of State

highways, and said that no better way could be devised for benefiting *all* the people of the State than by spending large amounts annually on the improvement of the roads. He promised to do all in his power to further the objects of the State's automobilists along these lines, especially in such an expenditure of the appropriations as would benefit large bodies of the people.

Mayor Weaver was at his best. An ardent automobilist himself, he could speak intelligently on the needs of motor car owners. He realized the need of automobile trunk lines, and called attention to Massachusetts' splendid roads as examples of what Pennsylvania automobilists should aspire to along this line. Turning to the speed limit problem, Mayor Weaver said he had that very afternoon, at a meeting of the Fairmount Park Commission, urged the abolition of the present seven-miles-an-hour ordinance now in force in that popular pleasure ground and the substitution of a fifteen-mile limit.

The excellent prospects of the good roads bill now before the legislature were discussed by Highway Commissioner Joseph W. Hunter. He took a shot at the toll gates, and said his plans contemplated the abolition of that bête noir of all automobilists. One of the first roads that will receive the attention of his department in this respect, he said, will be the old national highway between this city and Pittsburgh.

Addresses were also made by Henry F. Walton, who told of the work of the Pennsylvania Road Makers' Association, and by Director of Public Safety McKenty, who advocated more liberal speed regulations in city and country.

Quaker Hill Climb to Be Held in Fairmount Park.

PHILADELPHIA, March 11.—City Line road, from the east end of the Schuylkill River bridge, in Fairmount Park, to the extreme top of the hill on the west bank, has been selected by the Contest Committee of the Quaker City Motor Club for its hill climb on Memorial Day. The course, which is about a mile long, with easy going at the start and finish and the hard sledding in the middle, is amply wide and sufficiently steep to afford interesting racing, while from the viewpoint of the spectator it is ideal—easily reached by trolley and affording an excellent view of almost the entire route. The last quarter is an easy up-grade to the finish at Belmont avenue. The committee has arranged a program of eight events, classifying the cars according to price.

1. For cars valued at \$2,000 and under.
2. For cars valued between \$2,000 and \$3,000.
3. For cars valued between \$3,000 and \$5,000.
4. For cars valued at \$5,000 and over.
5. American championship, open to all American made cars.

To carry four passengers and complete equipment.

6. Free-for-all championship. Open to all cars.
7. Record trial.
8. Quaker City Motor Club championship. Open to all bona fide members who are not in the automobile business.

Election of the Automobile Club of Hudson County.

JERSEY CITY, N. J., March 11.—At the annual meeting of the Automobile Club of Hudson County, held at the clubhouse, corner of Clinton and Crescent avenues, the following officers were elected for the coming year: President, J. V. Z. Anthony; vice-president, John P. Landrine; board of governors, J. H. Edwards, H. T. Pond, Herbert Scott, E. M. Dixon, Dr. L. A. Opdyke.

Pennsylvania Federation Working for Its Bill.

PITTSBURG, March 11.—Active work is being done by the Pennsylvania Motor Federation in the interest of the new Motor Vehicle bill prepared by them. Twelve thousand circular letters to motorists of Pennsylvania left Federation headquarters last week asking the aid of each resident of the State holding a license to put this through. A committee is also at work at Harrisburg.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
 March 21-23....—Toledo, O., Automobile Show, Coliseum, Toledo Dealers' Association.
 March 21-30....—New Haven, Conn., Second Regiment Armory, Automobile Show, under the auspices of the local dealers.
 April 1-6.....—St. Louis, Mo., Automobile Show, Jai Alai Building, St. Louis Automobile Dealers' Association.
 April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
 April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Races, Hill-Climbs, etc.

April 1.....—St. Louis, Mo., Auto Floral Parade, Automobile Club of St. Louis.
 April 8-9.....—Harrisburg, Pa., Two-day Endurance Run, Automobile Club of Harrisburg.
 May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
 Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize. Aero Club of America.

Motor Boat Races.

June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
 July 20.....—New York to Marblehead, Mass., 270-mile Motor Boat Race. New Rochelle Yacht Club.
 Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

March 7-16....—London, Olympia Commercial Vehicle and Motor Boat Show.
 March 15-23....—Edinburgh, Scottish Cycle and Motor Show.
 Mar. 24-April 1....—Prague, Austria, Automobile Show.
 April 6-13.....—London, Agricultural Hall Motor Show.
 May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
 May 15-26.....—Zurich, Third Annual Swiss Automobile Show.
 June 25-30.....—St. Petersburg, Russia, Automobile Show.

Race Meets, Hill Climbs, etc.

March 20-27....—Nice (France) Automobile Week.
 April 1-16.....—Spring Wheel Competition, A. C. of France.
 April 2-15.....—Monaco Motor Boat Exhibition and Races.
 April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
 April 25-28.....—Touring Contest, Automobile Club of Touraine.
 April 28.....—Chateau Thierry Hill Climb.
 May 18-21.....—Milan, Italy, Touring Club Trials.
 May 24-27.....—Voiturette Contest, Automobile Club of Austria.
 May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
 May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
 May 29-June 1....—Irish Automobile Club Reliability Trials.
 June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
 June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
 June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars. Georges Dupuy, secretary, 1402 Broadway, New York City.
 June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
 July 2.....—Grand Prix, Automobile Club of France.
 July 14, 1908....—Paris to London, Aerial Race.
 July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
 July 21.....—Ardennes Circuit (Belgium).
 July 31.....—Liedekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
 July 31-Aug. 8.—Belgium Regularity Contest for Touring Cars. A. C. of Belgium.
 August 1-7....—Criterium of France, 1,750 Miles Touring Competition and 250-mile race for the Press Cup. A. C. of France.
 August 11-20....—Coupe de Auvergne.
 Sept. 1.....—Italy, Brescia Circuit, Florio Cup. A. C. of Italy.

AEROPLANISTS MAKE TRY-OUTS.

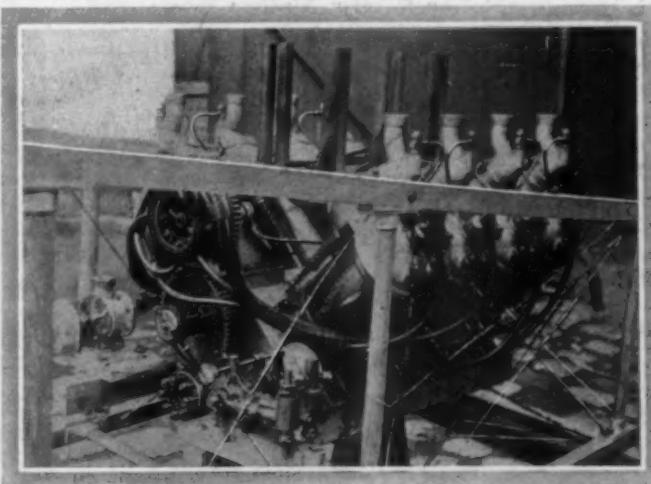
PARIS, March 5.—Notwithstanding the particularly severe winter, aero men have displayed much activity in the building shops and an impatience to practically test their new flyers. M. Kapferer brought his new aeroplane out on the Bagatelle ground, but did not attempt flight owing to a few defects discovered at the last moment and the rather unfavorable state of the weather. M. Leon Delagrange chose the military drill ground at Vincennes on the eastern border of Paris for the experimental trip of his flying machine. The Delagrange machine is similar in general construction to the latest Santos Dumont aeroplanes, consisting of a number of cells formed by a light wooden frame covered with silk. It has a total carrying area of about sixty square meters for a weight of 640 pounds. The rudder is placed in front and a 40-50 Antoinette motor drives a two-bladed propeller at the rear. The motor is of the eight-cylinder type with cylinders forming V and induction feed. Gabriel Voisin, the builder of the aeroplane, mounted the machine for the trial trip, which was witnessed by a select number of aero experts and a big crowd of Vincennes idlers. Seated on a saddle above the two wheels supporting the machine, Voisin made a good start and ran a few hundred yards at a speed of sixteen or eighteen miles an hour. The ground had been ploughed up by the frequent passage of heavy field guns and mounted troops, and under the heavy strain imposed the machine suddenly collapsed and came to a stop. Voisin's position looked dangerous, but he extricated himself without much difficulty. The motor was uninjured, but the propeller shaft was bent and severe damage done to the frame. It will probably be ten days before the machine will be ready to attempt another flight. So far as can be judged the framework is too light to stand the strain of fast travel. M. Voisin says he is certain of a successful trip.

The latest automobile constructor to enter the aero field is the Marquis de Dion, head of the firm of De Dion-Bouton. He has constructed a model of an aeroplane one-tenth actual size, and is now making equilibrium experiments with the apparatus.

AERO EXPERTS SAIL FOR FRANCE.

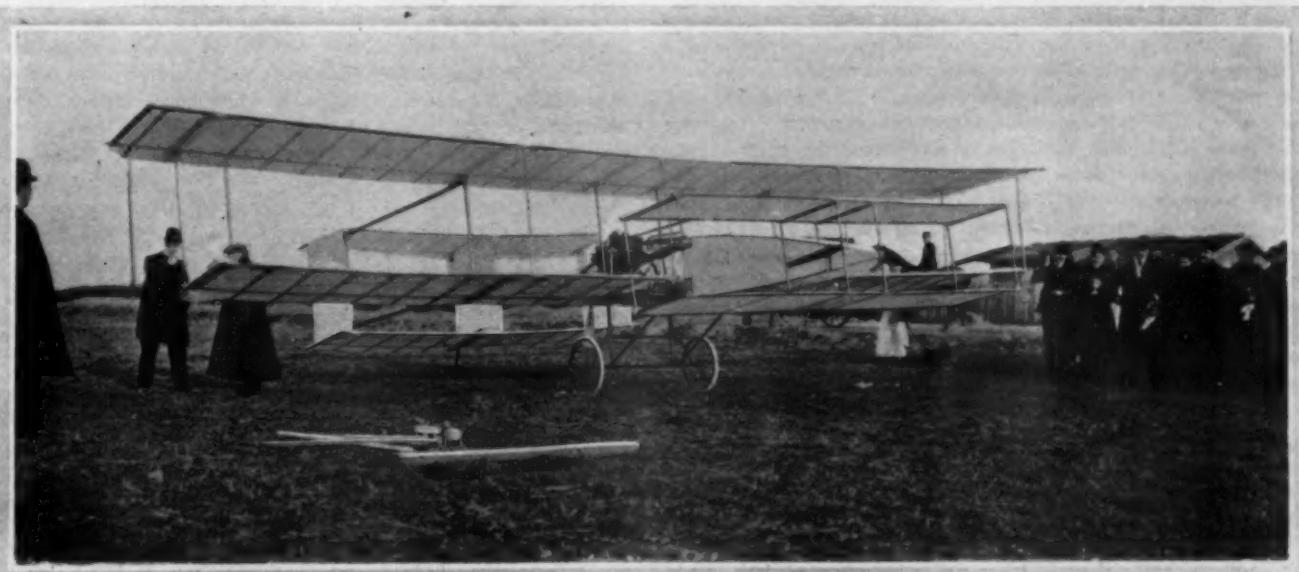
ST. LOUIS, March 11.—The St. Louis Aero Club will become the possessor of several new balloons this season. About a month ago an order was placed with a French builder for a varnished cotton balloon of 80,000 cubic feet capacity, to be used in the Gordon Bennett balloon race next October. The balloon will be called the *St. Louis*. Alan R. Hawley, who will pilot

the *St. Louis* in the race, has placed an order in France for a smaller balloon of 50,000 cubic feet capacity to be used by him for ascensions in and around New York. Several members of the St. Louis club are endeavoring to raise funds for the purchase of a small club balloon. If the necessary amount is obtained, the order will be placed in France. It is also possible that the balloon *United States*, with which Lieutenant Lahm won the first Gordon Bennett race, may be purchased by the club. A. B. Lambert, one of the charter members of the St. Louis club, has sailed for Europe and expects to be joined by Alan R. Hawley early in May. They will make ascensions in the two balloons



ANTOINETTE 40-45-H.P. AEROPLANE MOTOR.

under order and Mr. Lambert will endeavor to obtain the pilot certificate of the Aero Club of France. Since the Aero Club of St. Louis was organized last January, the plans for the big race in October have been practically perfected. The club has just appropriated \$15,000 to fence in the fourteen acres of Forest Park that have been granted for the use of the balloonists. Grand stands will be erected and a number of canvas aerodromes will be set up as quarters for the different nationalities entered in the contest. The balloon ground is only a short distance from the main gas works and a system of pipes has already been installed connecting the largest gas tank with the field. Four million cubic feet of gas can be supplied if necessary.



DELAGRANGE AEROPLANE READY FOR ITS EXPERIMENTAL FLIGHT ON THE DRILL GROUND AT VINCENNES.

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Boston's Show a Great Record-Breaker.

If there has been any doubt in the minds of the powers that be in the various strongholds of the industry as to the exact status of the Boston show, surely the present event must have sufficed to banish it completely. Though secondary in importance from the viewpoint of the manufacturer in that it is purely a dealers' show and, in many respects, more or less local in its character, there is no show held anywhere in the country that has better justified its existence. And this despite the fact that it is perforce relegated to a time of the year when all concerned would much prefer to be able to devote their entire time and energy to other interests. More than that, Boston labors under even greater disadvantages in the matter of suitable exhibition buildings than most other cities, having to make the best of structures poorly adapted to the purpose, with an overflow situated several blocks from the main building.

The event now under way at the Hub and which will close next Saturday night is the fifth of its kind to be held there, and it will go down into history not alone as the most successful show that Boston has ever seen, but the largest aggregation of cars and accessories ever brought together in this country. If mere numbers go to make success in a thing of this kind, both the national shows held in New York and Chicago must take a back seat, for Boston has outdone them all in the matter of size and completeness. There are no less than 121 cars of different makes exhibited, so that, although it has never been accorded that title in the past, nothing of the kind ever held in the United States

can justly be said to be more truly representative of the industry as a whole, and in that respect, national, than the down-east gathering of this year. Whether it be gasoline, steam or electric, there would hardly seem to be a well-known car made in this country that is not represented, and, true to precedent, this year's show has been productive of the usual number of newcomers, not a few of which exhibit productions of an order that may well rank with the best efforts of old-established makers. And as is to be expected in conjunction with such a notable array of cars, the showing of accessories is on a similar scale. Taken all in all, Boston and its dealers may well be proud of the fact that they have been instrumental in bringing together the most complete showing of automobile products ever assembled at a similar event anywhere in this country, and that is saying a great deal.

The Demand for Earlier Show Dates.

With manufacturers knocking the calendar all awry by bringing out their models of the following year at least six or seven months in advance, so that plenty of 1907 cars had a good chance to be old in service before 1906 expired, and starting on their 1908 product long before the 1907 touring season has even opened, it is little wonder that there is an insistent demand for much earlier show dates. Within the past two years, some of the makers have caught up with themselves and gained a lap, so to speak—they are working almost a year ahead so far as designs are concerned and if they keep on making progress at the rate that some of them have been beating the calendar, it will be no surprise to see exhibits at next winter's shows labeled, "Model of 1910."

The time when the majority of makers had to concentrate every effort for several months before the advent of the show on a few sample cars to be exhibited at the latter, and then retired to build a few more to fill the orders they had booked, has become so much a thing of the past as to be practically forgotten. Manufacturing conditions have changed entirely and the demand for time in which to build cars in order to make early deliveries possible overtops all other considerations. Hence the need for earlier shows and makers and dealers in all parts of the country are unanimous on this point. From present indications it appears that this may mean a show in the Garden in November, the Palace and Chicago shows in December, and the Boston show in January—cutting the show season practically in half.

The Dust Problem Again to the Fore.

Though it is far from being an ideal season for touring or, for that matter, one that favors the use of the automobile in any respect, there is one thing that can be said of winter, which the great majority of autoists are unanimous in hoping may some day be equally applicable to seasons of the year when the weather is not quite so rigorous, and that is its absence of dust. Winter roads are a combination of snow, ice and frozen ruts of mud that work havoc with tires and are not negotiable without the aid of devices which also tend to raise the tire bill, but above all they are dustless. What that means can only be appreciated by the rural dweller along some highway frequented by automobiles, and no less by the autoist himself, when perchance he finds himself compelled to breathe the choking cloud.

Vast sums of money are being raised in this country for the work of road building and road improvement, and in the aggregate millions of dollars will be spent in the work during the coming season in a comparatively few of the Eastern States. Experience has shown that the ancient methods of road building thus far adhered to are no better suited to horse traction than they are to the automobile. If a road is to be permanent, it must be proof against rapid disintegration, and not until steps are taken to this end will we have anything even approaching a dustless road. It is to be hoped that the large sums to be spent will not be frittered away in doing something that will shortly have to be done over again at equally great expense.

CUTLER SUCCEEDS DAY IN THE A. L. A. M.

"Owing to the continued illness and absence of George H. Day," reads the typewritten statement given out by the ruling body of the A. L. A. M. at the end of a two days' session, "E. H. Cutler has been placed in charge of the association as chairman of the Executive Committee, and enters upon his duties at once. Mr. Cutler has been prominently identified with the industry for many years, having been president of the Knox Automobile Company, Springfield, Mass., since its inception, president of the N. A. A. M. for two years, and for several years a member of the executive committee."

GILSON AND BENSON MAKE CHANGES.

Ernest R. Benson, for a number of years manager of the Boston branch of the Hartford Rubber Works Company, has been elected secretary and sales manager of the parent company, with headquarters at Hartford. J. W. Gilson, his predecessor in office, resigns to go with the Mitchell Motor Car Company, a prominent member of the American Motor Car Manufacturers' Association as sales manager.

INDIANA MAKERS AID A Y. M. C. A. PROJECT.

INDIANAPOLIS, IND., March 11.—Quite a remarkable campaign for raising funds for a new Y. M. C. A. building closed here the other day. In two weeks' time \$250,000 was raised. The success of the undertaking was due largely to the aid given by automobile manufacturers and dealers. C. E. Test and A. G. Newby, of the National Motor Vehicle Company, and D. W. Marmon, of the Nordyke & Marmon Company, contributed \$1,000 each to the cause, while Carl G. Fisher, of the Fisher Automobile Company, telegraphed a subscription of \$500 from New York City.

A. L. A. M. DISCUSSES EARLY SHOWS.

While "nothing definitely decided and nothing to make public" is the only response forthcoming to an inquiry as to what was done at last week's meeting of the Executive Committee of the Association of Licensed Automobile Manufacturers, it is a matter of common knowledge that show business was the chief thing before the meeting, and that the advisability of an earlier date was very much to the fore. It is definitely announced that the option on Madison Square Garden held by the association will be availed of and the show held there for the next two years at least, and it is further thought the next event of the kind will be in November instead of January, as heretofore. It is also understood that the matter of admissions was up for discussion, and that, owing to the cramped quarters and great demand, there seems to be little doubt but that prices will be doubled, and probably quadrupled, at least on one or two days of the week. The report of the treasurer, H. H. Franklin, showed the association to be in flourishing condition financially.

AMERICAN CARS FOR THE VANDERBILT CUP.

Entrants for the American Elimination Trial of the Vanderbilt Cup race are being announced, and an increased number over that of last year appears to be assured. The Royal Tourist, Lozier, Welch, Ford and Moon are newcomers to the 1907 list, while the repeaters will include Locomobile, Thomas, Pope, Haynes, Christie, Frayer-Miller, Matheson and Oldsmobile. There will probably be three Thomas cars, perhaps three Pope-Toledos and also three Loziers. Of course, the Ford racer will be the product of Henry Ford, and much is expected of the six-cylinder that he will bring forth. Robert Jardine again will be the designer of the Royal Tourist candidate, and Louis P. Mooers is to be the architect of the Moon racer. Mooers is well remembered as the builder of a Peerless car for the Irish Gordon-Bennett and also as the designer of the Peerless *Green Dragon* driven by Oldfield. It is understood that the Dragon and Wayne may be participants in the Elimination contest.

RUSSIA WILL HAVE FIRST AUTO SHOW.

Up to the present Russia has remained an almost entire stranger to the automobile. It would appear, however, that this state of affairs will soon be changed and that the land of the Czars may become an important field for the automobile manufacturer. The Automobile Club of Russia is organizing an automobile show in the Michel Hall at St. Petersburg, to be held from the 1st to the 17th of June next, under the presidency of the Grand Duke Michel Alexandrovitch, brother of the Emperor. Naturally, the organizing committee writes in the most glowing terms of the possibilities of the automobile in their country. The large towns such as St. Petersburg and Moscow cover a very large area. During the five months of winter horse traffic over ice and snow is very difficult, while automobiles travel about with perfect ease. On the commencement of the summer season the wealthy inhabitants of St. Petersburg remove to the islands a few miles from the city, to Peterhof, Tsarkoie-Selo, or other summer stations within a forty-mile radius, traveling into the capital every day. Locomotion is of a very rudimentary nature and the automobile would here play an important rôle. The popular idea that Russia is not provided with roads is a myth. It is certainly not so favored as France in this respect, but her highways are equal to those of the Eastern States of this country.

TAXIMETER ENTERPRISE IS CHRISTENED.

C. W. Kelsey, who is responsible for the idea of introducing the Parisian taximeter cabs to New York's streets, has just made public the name of the new concern, which will be called the American Cab and Express Company. While New York will be its headquarters, efforts will not be confined to this city, but a similar service inaugurated in other large centers, such as Philadelphia, Boston, and other large cities. Mr. Kelsey states that the facilities of the new company will greatly exceed those at present available in Paris, where there are about 1,000 cabs on the streets. An effort will be made to do away with the overcharge and tip nuisance now so universally practised by cab drivers, a notice to the effect that the "motormen"—this is to be their title—are not permitted to accept fees, being posted inside the cab. These motormen will all be graduates of a school to be maintained at the factory. They will be thorough mechanics and capable of making all road repairs. The machines will be equipped with pneumatic tires on removable rims and a spare inflated tire will always be carried, obviating loss of time in making replacements or expense from running on flat tires.

SAD END OF A WELL-KNOWN TRADESMAN.

Leonidas Preston, for some years a salesman for the Timken Roller Bearing Axle Company, of Canton, O., and later general manager of a New York corporation of the same name, and vice-president of the Hewitt Motor Company, of this city, committed suicide on Thursday last by taking poison when about to be confronted by his business associates, William T. Timken of Canton, president of the concern bearing his name, Leonard Gray, treasurer of the same company, and Edward Hewitt, of the Hewitt Motor Company, who called upon him for an accounting. His business affairs were found to be badly tangled and he was personally heavily involved in debt, said to have grown out of a passion for betting. He was a native of Dallas, Tex., where he was born forty-six years ago, and had been identified with the automobile industry for several years through his connection with the Timken company.

THE A. S. M. E. TO MEET ON MARCH 21.

The American Society of Mechanical Engineers will hold its next meeting in the large auditorium in the society's building at 29 West Thirty-ninth street, New York City, Thursday evening, March 21. John W. Lied, Jr., vice-president of the society, will deliver a lecture on Vesuvius and Pompeii, which will be interestingly illustrated by a series of slides from photographs.

THE LEGISLATIVE BOARD OF THE A. A. A. IS NAMED.

THE personnel of the Legislative Board of the American Automobile Association is announced by President W. H. Hotchkiss. It will be noticed that on the board are included representatives of the automobile manufacturing associations including Chairman Terry, counsel of the National Association of Automobile Manufacturers, it being the belief of the executive officers of the A. A. A. that such associations and the national body of motorists can best work together, both to secure and to prevent prejudiced legislation.

Chairman Terry will shortly call a meeting of the board in New York City. At such meeting the bill recently prepared by him and introduced by Congressman Cocks will be discussed, as will also a proposition looking to the drafting of a model State motor vehicle law for submission to the State Legislatures next year. At such meeting the condition of legislation in the various States will be taken up and actively canvassed.

The legislative board is made up largely of lawyers, and, while properly not so large as the Touring Board, is quite representative of the States where the automobile is at present largely used. Its work will undoubtedly be subdivided, and, as in the case of the Touring Board, put in charge of an executive committee small in number, but thoroughly representative of the different sections of the country.

The 1907 A. A. A. Legislative Board.

Chairman, Charles Thaddeus Terry, 100 Broadway, New York City.

W. W. Niles, New York.

Sidney S. Gorham, Chicago, Ill.

Francis A. Hurtubis, Jr., Boston, Mass.

James T. Drought, Milwaukee, Wis.

Roy F. Britton, St. Louis, Mo.
 M. Felton Hatcher, Macon, Ga.
 Osborne I. Yellott, Baltimore, Md.
 J. Jerome Hahn, Providence, R. I.
 Wade Cushing, Cincinnati, O.
 Robert Brown, Indianapolis, Ind.
 J. B. Parkinson, Daytona, Fla.
 William McL. Faysoux, New Orleans, La.
 Robert Lee Morrell, New York.
 D. F. Gay, Worcester, Mass.
 Walter S. Schutz, Hartford, Conn.
 G. Allen Hancock, Los Angeles, Cal.
 James E. Cooper, New Britain, Conn.
 John L. Griggs, Paterson, N. J.
 Dr. F. L. Bartlett, Denver, Colo.
 D. M. Ferry, Jr., Detroit, Mich.
 C. C. LaForge, Decatur, Ill.
 Reuel Small, Washington, D. C.
 Alexander Schwaiback, Brooklyn, N. Y.
 G. Douglas Bartlett, Philadelphia, Pa.
 Homer H. Johnson, Cleveland, O.
 F. D. Larrabee, Minneapolis, Minn.
 E. W. Seeds, Columbus, O.
 E. J. Kent, Pittsburg, Pa.
 William H. Spear, Jersey City, N. J.
 W. K. Bracken, Bloomington, Ill.
 Arthur J. Plummer, Malden, Mass.
 Charles H. Burras, Chicago, Ill.
 D. Emmet Welch, Grand Rapids, Mich.
 Carlton Godfrey, Atlantic City, N. J.
 John H. Barbite, Rochester, N. Y.
 William Walker Smith, Cincinnati, O.
 H. H. Myers, Duluth, Minn.
 George H. Wilson, Louisville, Ky.
 George C. John, St. Louis, Mo. (representing American Motor Car Manufacturing Association, New York).
 Giles H. Stillwell, Syracuse, N. Y. (representing Association of Licensed Automobile Manufacturers, New York).

MAKE UP OF THE A. A. A. GOOD ROADS BOARD IS COMPLETED

PRESIDENT HOTCHKISS, of the American Automobile Association, on Tuesday announced the full members up of the Good Roads Board for 1907, as follows:

Chairman, Robert P. Hooper, 509 Arch street, Philadelphia.
 John Farson, Chicago, Ill.
 Augustus Post, New York City, N. Y.
 W. P. Murray, Cleveland, O.
 E. Kneeland, Pittsburg, Pa.
 William T. White, Trenton, N. J.
 H. H. Trice, Norfolk, Va.
 C. Gordon Neff, Cincinnati, O.
 John M. Satterfield, Buffalo, N. Y.
 Frank X. Mudd, Chicago, Ill.
 W. R. B. Whittier, Atlanta, Ga.
 W. H. Chase, Leominster, Mass.
 Henry G. Strong, Rochester, N. Y.
 Arthur Stein, Cincinnati, O.
 Walter E. Edge, Atlantic City, N. J.
 R. A. Whitney, Peoria, Ill.
 William Neil, Columbus, O.
 B. Clinton Slagle, Baltimore, Md.
 F. A. Burrell, New York.
 Joseph H. Wood, Orange, N. J.
 A. E. Demange, Bloomington, Ill.
 Daniel P. Ray, Olean, N. Y.
 G. K. Wheeler, Kansas City, Mo.
 S. W. Kent Miller, Hagerstown, Md.
 George H. West, Detroit, Mich.
 Palmer Abbott, New Orleans, La.
 George M. Palmer, Mankato, Minn.
 C. Roy McCanna, Burlington, Wis.
 A. G. Widmer, Seymour, Ia.
 Ben Weille, Paducah, Ky.
 Dr. F. L. Bartlett, Denver, Col.
 A. J. Smith Los Angeles, Cal.

Chairman Hooper expects shortly to call a meeting of the board for the purpose of sub-dividing its work.

The board will also doubtless take up a question at present much discussed by autoists, that is, whether they and their associations should not from this time take an open position instead of a covert one as to the good roads movement in the various States. It has often been said that owing to the early antagonism between the motorist and the farmer, the two classes of the community most interested in good roads, more would be accomplished by leaving these movements to Grange organization and legislators representing rural communities. Of late, however, it has been thought that a more open advocacy by motorists would be both wise and profitable. Chairman Hooper will present this question, and on its determination will, perhaps, depend the attitude not merely of the A. A. A., but also of its affiliated State associations and clubs in present day movements looking toward good roads.

Another subject which will be discussed will be the best ways and means to accomplish federal aid toward the improvement of at least the trunk roads in the various States.

Chairman Hooper has been named by the Governor of Pennsylvania as one of the representatives of that State at the Fourth Annual Convention of the American Road Makers' Association, at Pittsburg, this week.

An admixture of from 20 to 30 per cent. of glycerine is commonly added to the circulating water of an automobile to prevent it freezing. An automobilist, writing to *Omnia*, declares that he has obtained an excellent anti-freezing solution by the addition of about the same proportion of molasses to the water. The cost is less than glycerine and the effect somewhat better, according to the results of the experiments made.

MAKING PLANS FOR A. A. A. TOUR.

Chairman F. B. Hower of the A. A. A. Touring Board is confident that the annual tour for the Glidden and other trophies will be a successful event which will do much good to the general cause of automobiling. The board's executive committee will have a session to-day at Buffalo and much will be accomplished towards plans for the tour.



CHAIRMAN F. B. HOWER.

Present indications point to an endurance tour starting in some Middle West city, a Sunday stop-over in Chicago, and a finish in New York City. From Boston comes the reports that the trade and clubs are not particularly interested in the tour starting from that city. A ten-day tour of 150 miles or more per day, with the Glidden trophy going to the club which supplies the greatest proportionate number of survivors in case of a tie, is what seems to meet with some general approval.

BIANCHI OWEN INTERVIEWED IN PARIS.

PARIS, March 4.—An American automobile agent who is very Italian in his preferences at present is Percy Owen, of New York, who has been in Paris a few days after a visit to Italy, and who, accompanied by Mrs. Owen, is returning to New York by the *Kaiser Wilhelm II*. Signor Owen has just come from Milan, where he devoted some time to an inspection of the Bianchi automobile factory, and he is convinced that the Bianchi is the best machine in the world. He admits that he may be slightly prejudiced in favor of the Bianchi, of which he is American agent.

"In America," he remarked, "nearly all Italians are just plain dagoes in our estimate of them, but I wish more of my countrymen would go to Italy and make the acquaintance of a few self-made aristocrats, like Signor Bianchi, for instance, who began twenty years ago with a hand lathe, making bicycles, and now has the finest automobile factory I ever saw. When we first heard of the Italians making automobiles we were incredulous, inclined to smile, but the truth of the matter is that the Italians are making far better automobiles than the Americans and also better than the French."

Signor Owen seems inclined to accord the term "first-class" to only one American make, and this one begins with a P. As there are several in the United States that correspond to this initial, none of the manufacturers of "P" automobiles can take offense, and all can be flattered. The qualification of "first-class," however, is used only in a comparative sense, as among the domestic products. Signor Owen was the guest at a banquet given before he sailed. Notabilities of local auto circles were present.



"SIGNOR" PERCY OWEN.

PARIS EDITOR ON THAT "INVASION."

PARIS, March 6.—Really, the Americans hesitate at nothing. We knew it already, but they have just given us another proof of it. They noticed that Europe, and especially France, sold them a large number of automobiles, and as they have never been able to enter any open contest, either race or competition, without receiving the most formidable slogging you can imagine, they have organized a monster contest reserved to American cars.

Well, you will say, there is nothing very stupid in that; and in what corner of America will the contest be held?

None at all; it will be in France.

What? in France? Sure. In France.

Well, if you want cheek, that is cheek. It is bad to invite yourself to dinner without informing the master of the house, but to spread abroad the invitation and not ask the host to sit down at the table is still worse.

It is Georges Prade, the fiery editor of *Les Sports*, an important Parisian journal, who, like his historic compatriot Cambronne, has allowed his feelings to get the better of him. Unlike that brave soldier, however, he does not employ one word, but five columns of the first page of his journal to denounce those wicked Yankees who are daring to take part in the European tour.

The regulations and preliminary circulars regarding the tour are given in full, with numerous comments, many of them amusing, on the salient features of the project. Thus: "You see that Paris is the only town in which they will stay several days; their desire is to capture our trade and influence the public." E. R. Thomas is designated in a footnote as "the man who entices away French foremen; this time he is working at home." "The author of the scheme, after avowing its commercial object, will ask for prizes from the heads of the countries whose trade he wishes to conquer," comments the French journalist. "There is only one thing more to be done, and that is for the President of the Republic to invite the members of the caravan to dinner and wish them good luck in their efforts to capture French trade and ruin French workmen." The table of penalty points for changes of parts en route draws forth the remark that the "organizer understands American machines; he has made provision for changing everything; what matter so long as they get through."

"To take a French automobile into America 45 per cent. of its value has to be paid in custom duties, or 7,200 francs, for a medium car; if the machine is American it costs but 625 francs to bring it into France. The Americans invite the heads of the States and of the automobile clubs to witness their caravan. We invite them not to witness it, but to forbid it. We have never boycotted American machines and our races have always been open to foreigners. But to allow a contest on our roads, in our cities, before our customers, in which our machines are boycotted, with the avowed object of capturing our trade, that is not hospitality; it is idiocy."

Coming to the attack later, Prade says: "Three times we have gone to New York, and three times we have won the Vanderbilt Cup, but we never asked the Americans not to compete. Let them take part in our Grand Prix and we will lick them; let them take part in our competitions and we will lick them again; but it will be difficult to beat them in a contest, even in France, in which we are kept out."

L'Auto, a rival journal and the semi-official organ of the A. C. F., sees no reason for fear. "Why should not the Yankees have a pleasant excursion in France, drink cocktails in our country and leave their bank notes behind? If they want to capture our trade they will not wait until a Frenchman takes them on an excursion in France; they would have agents here, machines on view; they would advertise. But they don't do that, and the reason is that they are not ready. So long as they are producing their present horrors there is no cause for fear." *Les Sports* turned red with rage at this flippancy and war is now declared between the rival journals.

PROMINENT FIGURES OF THE AUTO TRADE.

R. HARRY CRONINGER, who has just taken the position of sales manager and will also have in hand the general management of the Pennsylvania Auto Motor Company at Bryn Mawr, Pa., was practically responsible for the formation of the Dayton Motor Car Company, the Ohio concern which makes the Stoddard-Dayton car, the success of which is well known. Mr. Croninger's new place will carry with it added responsibility. The Pennsylvania company is a corporation of \$200,000 paid-in capital, and its car sells for \$2,750. The company was started by Charles J. McIlvaine, Jr., of Philadelphia, a man with great confidence in the future of the automobile industry. Mr. Croninger is one of the veterans of the trade, having been formerly connected with the bicycle manufacturing industry, and, like many of its leading men, was early impressed with the possibilities and future of the automobile.

C. ARTHUR BENJAMIN, the new general manager of the Aerocar Company, also carrying the title of vice-president, is one of the pioneers of the industry. "Ben" first sold steam cars, later he became an air-cooled advocate, then next studied the more leisurely electric field, and now returns to his air-cooled proclivities. Once registering from Syracuse, later subscribing himself as from Buffalo, he now places Detroit, Mich., after his name. That smile of Benjamin's is known throughout the land, for he has sold automobiles in practically every State, and in the years gone by the thousands of good bicycles which he disposed of made him an acceptable caller when he went over more or less of his old route for the motor-driven vehicle.

JOHN G. PERRIN, the designer of the Lozier car, who is largely responsible for its originality in design and construction, is of the younger school of automobile engineers who combine a practical experience and motoring knowledge with a thorough technical education. He graduated in the technical course of the Toledo

High School in 1893 and entered the shops of the Lozier company at Toledo, O., when this company was constructing bicycles, worked through all the departments, and in 1894 was detailed to superintend special work done in a temporary plant installed at Hartford during the erection of new branch works at Thompsonville, Conn. After this factory was erected, Mr. Perrin was given the position of assistant superintendent, which position he held for over two years, and in 1896 returned to the Toledo plant to superintend experimental work

on small motor vehicles. From this time forward all the experimental work and designing on automobiles and marine engines was carried on by Mr. Perrin, and the Lozier steam carriage of 1897 was one of his developments. But he soon realized the position the gasoline car was destined to fill and turned his attention to it.



FIRE CHIEF BRODERICK OF DETROIT IN A WAYNE.

The chief utilizes the Wayne car in his departmental work of inspection, etc.



AUTOMOBILE EXPORTS CONTINUE TO SOAR.

For the month of January, 1907, the total value of automobiles and parts exported reached the sum of \$376,467, as compared with \$297,694 for the corresponding month of 1906. Of the former sum, \$311,242 represented the value of 214 complete cars, and \$65,225 worth of parts, the proportionate growth in these items not being evident, as the value of the parts was not stated separately prior to July 1, 1906. As usual, the largest single item is that of the United Kingdom, amounting to \$114,191, while the smallest, considering the automobile manufacturing nations, is Germany, with but \$4,806. For the period of seven months ending January, 1906, the total amount exported was \$1,438,000, as compared with a value of \$2,429,543 for the corresponding period ending with January of the present year. The latter was composed of the sum of \$2,103,556, representing 1,369 complete cars and \$325,993 worth of parts. The table for January follows:

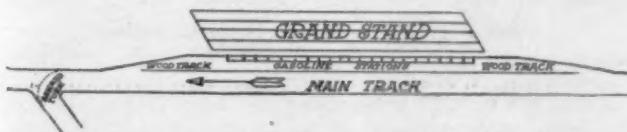
	January.	1906.	1907.
Automobiles, and parts of.	297,694		
Automobiles	No.	311,242	
Parts of	65,225	
Exported to—			
United Kingdom	114,991	66,698	
France	16,369	26,380	
Germany	4,806	9,171	
Italy	20,005	41,070	
Other Europe	4,448	10,082	
British North America	22,107	37,638	
Mexico	30,925	55,932	
West Indies and Bermuda	40,461	35,975	
South America	3,588	23,839	
British East Indies	4,147	4,673	
British Australasia	32,669	52,157	
Other Asia and Oceania	2,000	9,713	
Africa	1,168	819	
Other countries	1,320	
Total	\$297,694		\$376,467



FIRE CHIEF OF CHILlicothe IN HIS LOGAN SEMI-RACER.

LATEST GRAND PRIX DEVELOPMENTS

PARIS, March 4.—A question which always arises a few months before the date fixed for an important European race is how the competing machines will be started. French competitors are already asking this question regarding the Grand Prix. An answer can, of course, only be given by the racing board, and it is not safe to prophesy what their decision will be. The Dieppe circuit is only about 47 1-2 miles round and not 50 as was at first supposed. There will be 34 starters in the Grand Prix and nine in the Sporting Commission Cup, to be run at the same time, making a total of 43 cars. The minimum time possible between the start of big racing machines is one minute. A shorter interval



PROPOSED PLAN OF SIDE TRACK IN FRONT OF GRAND STAND.

is impractical, while if a two-minute interval were adopted the first cars would be round to the starting point before the last machine had been sent off. At 6 o'clock on the morning of July 2, the first machine, a 3.3 gallon racer, will be sent away. At nine minutes past six the first Grand Prix racer will take its flight, to be followed at intervals of one minute by its companions, the last one going over the line at 6:42. Supposing that the first Grand Prix machine covers the course at the rate of 74 miles an hour, and a higher speed is not to be expected, it will be at the starting line again in 38 minutes, or at 6:47—five minutes after the departure of the last machine.

An alternative method is to start the Grand Prix racers first at 6 o'clock, at intervals of one minute, and to send away the nine Sporting Commission racers about two hours later, at intervals of two or three minutes. As the smaller racers have only to cover 310 miles, compared with 500 for the Grand Prix competitors, they would finish about the same time.

The grandstands are on the right-hand side of the road. About fifty yards before reaching them will be built a wooden side track running parallel with the course the entire length of the stands and joining the course again about fifty yards beyond the end of the stands. Machines not needing anything from the station will pass the stands at full speed on the main road. Those needing gasoline, tires, water, etc., will run on the side track and take

what they need from the stations to be built on the edge of it, thus leaving the main track free for passing at the highest speed. It is on this side track that the Sporting Commission racers would be started.

Actual work on the circuit has not yet been begun, though the preliminary arrangements are being pushed forward. The racing board has rented a big plot of land three miles from Dieppe, on the sea leg of the course, at a spot known as Pollet. It is here that the grandstands and gasoline stations will be erected. The former will be on the seaward side of the road and will give a view of the racers running at full speed for seven miles. About four hundred yards beyond the stands is the sharp forked turn leading to the second leg of the course. It has been decided not to use this turn, but to unite the two legs by a specially constructed wide racing track built of wood, and equal to the best banked-up motorcycle tracks. Also on the coast leg of the circuit, and within easy distance of the sea, will be erected a huge camp where, for five dollars, visitors may obtain a camp bed, an evening meal and early breakfast.

Grand Prix drivers have already made their appearance on the course. A few days ago Garbet ran round the circuit a few times with a 120-horsepower Bayard-Clément racer of last year's model. It is expected that some of the new machines will be on the course in a few weeks. The report that many of the racers will be last year's machines slightly modified is absolutely incorrect. In nearly every case entirely new machines will be built. Most firms, indeed, have disposed of their last year racers and are obliged to build new ones. The three Darracq flyers will closely resemble those of last year, horsepower will be 100, and the weight will remain about the same; only detail changes will be made. Bayard-Clément will construct three four-cylinder motors and will not employ the six-cylinder racers constructed last fall. The new machines will have separate cylinders, 160 bore and 160 stroke, developing 120 horsepower at 1,200 revolutions, shaft drive, and will be built rather lower than last year. It is estimated that the fuel consumption will be 5 3-4 gallons per 100 kilometers. Motobloc has under construction five racers of 170 mm. bore by 150 stroke, developing about 120 horsepower. Announcement has been made by the Belgian factory building the three Germain machines for the Grand Prix that their racers will not develop more than 80 horsepower, and will weigh about 1,200 pounds. It will be interesting to watch them against machines of nearly double this weight and power.

TARGA FLORIO ENTRIES NUMBER FORTY-THREE

PALERMO, March 1.—Italy will open the European racing season in a worthy manner with the Targa Florio race on the island of Sicily on April 21. The engagement list has just closed with a total of 43 machines, made up as follows: Italy, 4 Fiat, 4 Itala, 3 Deluca-Daimler, 4 Isotta-Fraschini, 3 Junior, 2 Diatto-Clément; France, 2 Lorraine-Dietrich, 2 Darracq, 2 Berliet, 3 Bayard-Clément, 3 Gobron, 2 Radia, 1 C. V. R.; Germany, 3 Benz, 1 Opel; Switzerland, 2 Lucia, 2 Digne. The machines will be driven by Europe's most skilled drivers, among them being Wagner and Hanriot for Darracq, and Albert Clément, Garbet and Collinet for the Bayard-Clément factory.

The Targa Florio is being run on the island of Sicily owing to the impossibility of obtaining a guarded course on the mainland. Italy's war authorities last year refused to aid automobileists by loaning troops to guard the course, and in consequence seriously compromised the race season. The same policy is being pursued this year, but the difficulty is avoided by going to the picturesque island. Largely owing to the influence and liberality

of Chevalier Florio, all competing machines, together with their drivers and mechanics, are shipped free from Marseilles, Genoa, or Naples to Palermo. The prize list provides \$3,000 in cash for the winner, \$1,600 for the second, \$800 for the third, \$400 for the fourth, and \$200 for the fifth. In addition the winner will become possessor of the Targa, and every driver finishing the race will be presented with a reproduction of the cup as a souvenir. The event is a 282 miles speed contest over a 94 miles circuit of extremely varied nature. Hills are sufficiently formidable to test the climbing power of the machines as well as their brake power on the descents, a few straight stretches will allow of high speed sprints, and sharp turns will test the skill of the drivers. The regulations are simple, limiting the four-cylinder machines to a bore between 120 and 130 mm., with a weight limit of 2,200 pounds for the minimum bore; for six-cylinder motors the weight allowance is also 2,200 pounds for an 85 mm. bore, with an increase of 88 pounds for every additional millimeter bore. Last year the Targa Florio was won by Cagno with an Itala.

March 14, 1907.

PACKARD WINS CALIFORNIA CLIMB.

BY FREDERICK PABST.

LOS ANGELES, CAL., March 2.—The banner crowd in the history of automobiling on the Coast witnessed the second annual hill climb to-day up the mile and four-tenths grade from Pasadena to Altadena. It is estimated that 10,000 people were gathered along the road, and from the start to the finish autos were crowded under the cypress trees and palms which lined the course. Fully 500 cars took part from Los Angeles and Pasadena for the climb. It was an ideal California day. The sun shone with all the springtime warmth, and with pretty California maidens in their summerish togs perched on the back of the tonneau seats cheering the dashing automobiles, the sight was one of which Southern California could well feel proud.

The perpetual challenge trophy, won last year by a Thomas, went to Earl Anthony's Packard runabout, driven by Bert Latham. This was the last car to run the course, and from the start, as it swept up the grade between the lines of cheering spectators, it could be seen that it was making the fastest time.

When the winning Packard crossed the car tracks a serious accident was barely averted. At this point the car was going fully forty miles an hour, and as the crossing was struck the auto seemed to leap into the air three feet. People below the spot say daylight could be seen under all four wheels. The wheels did not hit the road straight, and at the great speed it was making Driver Latham had difficulty avoiding a collision with a number of machines lining the course.

The touring car honors went to the Pope Hartford. Bert Dingley, at the wheel of the Pope, drove a beautiful race. He swung around the first turn at forty miles an hour, and sent a great cloud of dust into the air. Faster and faster the car went as it got straightened away. Approaching the car track crossing Dingley saw the immense crowd gathered there closed in, barely leaving enough room for the car to pass. It was his intention to swing to one side and take the crossing at an angle, instead of going straight, and seeing the crowd was in the way he rose in his seat behind the wheel when about 75 yards away and motioned frantically for the people to get back. There was

COMING OF THE EIGHT-CYLINDER ENGINES.

HARRISBURG, PA., March 9.—At a meeting of the Engineers' Club of Central Pennsylvania, held in this city last night, Cecil H. Taylor, of Martin & Co., consulting engineers, made an address on the subject of motor design particularly with reference to the multi-cylindered motor of the future. The four, six and eight-cylindered types were dwelt upon at length with reference to their advantages on the score of reliability, durability, maintenance and repair.

"The six-cylinder motor is but a stepping-stone to the eight-cylinder V type for higher powers," said Mr. Taylor on this point. "This latter has all the advantages over the six that the six has over the four, and, in addition, those of low cost, compactness and higher weight efficiency. The eight-cylinder, V type, can be constructed, power for power, for about 75 per cent. of the cost of the six-cylinder. Its shape and size adapts it to being placed upon the chassis more advantageously than the latter without unduly lengthening the car."

"I believe up to 50 horsepower, or say 5½-inch bore, that the four-cylinder motor will hold its own, but that beyond this power the eight-cylinder, V type, will drive the six from the field. This would mean that the eight-cylinder would begin at about 4-inch bore, giving about 50 horsepower, above which the eight-cylinder motor will be the accepted type. There are certain difficulties, notably that of carburetion, which are encountered as the cylinder number is increased beyond four. The six-cylinder motor is not only educating the public, but the constructors as well, to the point where the eight-cylinder idea can be commercially put in practice, which will not be long in coming."

a rush as the crowding spectators realized Bert's intention, and as he swung across he did not miss the scurrying people by more than a few inches. The summary:

First Event—Runabouts, \$1,000 and Under.

Maxwell, 14 h.p.; Maxwell-Briscoe-Wilcox Co.	3:03
Mitchell, 20 h.p.; P. H. Greer	***

Second Event—Touring Cars, \$1,500 and Under.

Tourist, 20 h.p.; Auto Vehicle Co.	2:55 4-5
Mason, 20 h.p.; Lord Motor Co.	3:04 3-5
Reo, 20 h.p.; Leon T. Shettler	3:05 3-5

Third Event—Runabouts, \$1,500 and Under.

Tourist, 20 h.p.; Auto Vehicle Co.	2:40
Reo, 20 h.p.; L. T. Shettler	2:51
Buick, 22 h.p.; Western M. C. Co.	4:06

Fourth Event—Touring Cars, \$1,501 to \$2,000.

Mitchell, 35 h.p.; Greer Robbins Co.	3:24 1-5
Pullman, 20-25 h.p.; H. A. Stone	4:09 2-5

Fifth Event—Runabouts, \$1,501 to \$2,000.

Franklin, 12 h.p.; Ralph Hamlin	3:25 1-5
Elmore, 25 h.p.; A. J. Smith	3:58 4-5
Mora Car, 24 h.p.; J. F. McNaughton	4:32 4-5

Sixth Event—Touring Cars, \$2001 to \$2,500.

Rambler, 40 h.p.; W. K. Cowan	2:49
Tourist, 35 h.p.; Auto Vehicle Co.	3:00 4-5
Elmore, 25 h.p.; A. J. Smith	3:18 3-5
Dorris, 30 h.p.; A. C. Stewart	3:20 3-5
Knox, 30 h.p.; P. Billington	3:24 4-5

Seventh Event—Runabouts, \$2001 to \$2,500.

Stoddard-Dayton, 35 h.p.; V. Peyton	3:31
Tourist, 40 h.p.; Auto Vehicle Co.	3:02 1-5

Eighth Event—Touring Cars, \$2,501 to \$3,000.

Pope-Hartford, 30 h.p.; White Garage	2:38 2-5
Maxwell, 40 h.p.; M. B. W. Co.	2:56 1-5
Franklin, 20 h.p.; Ralph Hamlin	3:24 1-5

Tenth Event—Touring Cars, \$3001 to \$4,000.

Knox, 35 h.p.; P. Billington; \$4,000	3:44 2-5
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Twelfth Event—Roadsters, Free For All.

Packard, 30 h.p.; Earle Anthony; \$4,200	2:14 4-5
American, 40 h.p.; So. Cal. Motor Co.; \$3,250	***

ARDING TO DRIVE AMERICAN MORS CUP CAR.

H. N. Harding, who piloted the English Daimler in all its races last year, and drove the winning Haynes racer in the Vanderbilt Cup trial last fall, is the latest acquisition of the American Mors forces. Mr. Harding says that he believes the 40-52-horsepower American Mors to be not only the fastest stock touring car built in America to-day, but also, owing to its foreign materials and the extreme care-in construction and inspection of detail, better able to sustain the strain of hard usage than any other American car. Mr. Harding is now at the factory, familiarizing himself with the various models and trying out new cars. No special racing car will be built, but it is planned to enter regular stock models in all open events during the coming season. Designs are nearing completion for the six-cylinder, 120-horsepower American Mors racer to be entered in the Vanderbilt Cup trial this fall.

NEW YORK PRISON TO FURNISH SIGNBOARDS.

ALBANY, March 11.—The construction of good roads and the use of automobiles have largely increased highway travel, so that the need of signboards at the intersection of highways to guide travelers is much greater than it was. Many States, and especially those of New England, have erected signboards in recent years, but the highway authorities in New York State have done little in this direction. In order that all localities in this State may be furnished with substantial signboards, Superintendent of State Prisons Collins has arranged to furnish them from Clinton prison.

AN INGENIOUSLY DESIGNED NEWCOMER

QUITE the most radical and interesting departure from current practice that was revealed at the Hub show is the Bailey runabout. This is its title in brief and it is officially known as Model B, but its full name is somewhat more descriptive of its distinguishing features. It is the Bailey revolving four-cylinder, two-cycle runabout, and for the present its builders, the recently incorporated Bailey Automobile Company, Springfield, Mass., will devote their entire attention to this type of vehicle, adding a touring car and also a commercial vehicle later, the motor taking up such a small amount of space that it is particularly adapted to the needs of the latter. The motor is the result of several years' patient labor, each step in the detail of its design having been worked out at a time until its designer was certain of it, and the result has been such as to surprise even those who have hoped most for the outcome.

Design of Motor.—As already mentioned, the chief distinguishing characteristic of the Bailey motor is the fact that it is of the revolving type, having four cylinders placed on the diam-

eters of a circle at right angles to each other. But it has others that add to its interesting features, not the least of which is the employment of the two-cycle type of operation, and this combined with air-cooling makes it one of the simplest motors of its horsepower ever built. It will be readily evident that the working out of the design of the motor itself was complicated considerably by the

necessities of the situation in that suitable mounting presented a more or less difficult problem, and moreover one upon which the successful working of the motor depended to a very large extent. On the other hand, it simplified matters to some extent in that it permitted of easy and efficient air-cooling with a minimum of surface for radiation, and the momentum of the revolving cylinders made the use of a flywheel unnecessary. These two features have combined to make it possible to build a motor weighing but a third of one of the standard type of the same cylinder dimensions. As four explosions are obtained during every revolution and all four pistons are actuated by a single throw crankshaft which is held stationary, an unusually good mechanical and working balance is secured, with the added advantage of entirely eliminating vibration.

The crankshaft is hollow and the carburetor is attached to the end of it, the charge passing through the shaft and out through a universal cone valve to the various cylinders, all of which radiate from a common central crankcase. As the piston of a cylinder travels toward the head of the latter, a charge is drawn from the carburetor and through the valve in the crankshaft. Having finished its suction stroke, the piston closes the suction port, cutting off the supply, and the fresh charge is held in the base of the cylinder. On the down stroke of the piston the gas is forced up through a transfer passage and a balanced poppet valve into the combustion chamber on the other side of the piston, being there compressed and fired by the next upward stroke. The exhaust escapes through ports on each side of the cylinder uncovered by the piston in its descent and the same moment a fresh charge of gas is entering the same cylinder through the poppet valve in the head so that there is no possibility of mixing the spent and incoming charges.

Motor Details.—The crankshaft, the extreme shortness of which is noticeable in the illustration, is machined directly from chrome-nickel forgings and ground to exact size. It is held stationary by a steel casting resting on the cross member of the frame and also forms a support for one side of the motor. The other end rests on a large Hess-Bright ball bearing. The crankcase is made in two pieces of manganese bronze alloyed especially with a view to obtaining the maximum tensile strength. The case is oil-tight, and, as will be seen from the illustration, the back half forms the rear support for the motor besides serving to transmit the power; it also rests on a large Hess-Bright ball bearing. Two of the latter form the support for the entire motor, while the smaller bearing of the same type held in the back of the case forms the support for the end of the crankshaft. The bearings on the crankpins consist of four rows of special ball bearings, so that there are no bearings in the engine requiring adjustment.

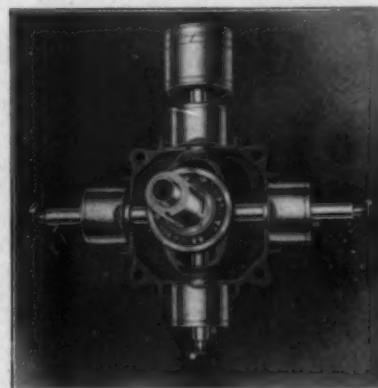
The cylinders are cast of high-grade, close-grained iron, are ground to exact size and are held on the crankcase by four 5-8 inch nickel-steel bolts having a tensile strength of 75,000 pounds to the square inch. The dimensions are 4 1-2-inch bore by 4-inch stroke and the motor develops 22-24 horsepower at 900 r. p. m. The intake pipe, valve seat and the cooling pins, of which there are comparatively few, are all cast integral with the cylinder, doing away with the necessity for using gaskets or bolts and making a most compact and effective unit. Particular care has also been taken in the selection of the iron for the pistons, which are fitted with two rings near the head and a third close to the bottom, the motor being designed to run on 70 pounds compression. Quite a radical departure from current practice is to be noted in the construction of the connecting rods, the design being known as a Scotch yoke. The pistons are secured directly to the connecting rods by means of a large nut, thus permitting

of no relative motion between the two and eliminating all side thrust of the piston on the cylinder walls. The inside of the yoke is hardened and ground and rolls on the races of the ball bearings of the crankpin, a ball or rolling surface being provided for every moving part. The use of a muffler is dispensed with by the provision of an an-



THE REVOLVING UNIT POWER PLANT

nular expansion chamber into which the exhaust escapes. This chamber, of five times the cylinder capacity, revolves with the motor, and by reason of the low temperature at which this serves to maintain it, makes the motor extremely quiet running, as well as eliminating any back pressure. The motor is suspended on two cross members placed 12 inches apart, one of which holds it on a large ball bearing while the other carries the bracket holding the stationary crankshaft. Both its placing and features of design com-



MINUS CYLINDERS AND CRANKCASE.

bine to render every part of the motor accessible as none of the mechanism is behind the dash of the car. The starting crank of the motor is geared in the ratio of two to one, thus rendering starting very easy, and such as a woman can readily accomplish.

Lubrication and Ignition.—This is of the positive type, the supply being maintained by means of a force-feed lubricator of the mechanical type. The oil is forced through an aperture in the

crankshaft issuing at the crankpin, where it is first used to lubricate the latter. After leaving this bearing the oil is quickly and thoroughly distributed about the interior walls of the crankcase by means of the centrifugal force developed by the revolution of the motor. This tends to keep it at a point furthest from the center, and here there is an automatic ball check provided which, acting by

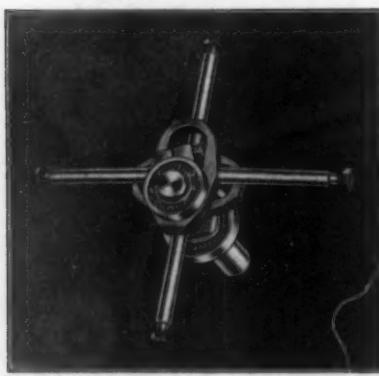
reason of the same force, permits the oil to flow upon the pistons as soon as the motor begins to revolve, but prevents any from passing while the motor is at rest. Thus the centrifugal force generated by the motor when in operation is caused to act as a pump for the lubricating oil, which it is said to do very efficiently. But for this ingenious device, the cylinder that was downward when the motor stopped would become flooded with oil between the interim of stopping and restarting the motor. The ignition is of the high-tension type, the spark plugs being placed in the sides of the cylinder near the head, current being supplied by a magneto, gear-driven directly from the motor.

Transmission Details.—The transmission is combined with the rear axle in such a manner that the latter and the engine may be placed in almost the same horizontal plane, thus eliminating the loss customary with universal joints made necessary by the angularity of the propeller shaft. The motor shaft is but 5 1-4 inches above the level of the rear axle, but is so arranged as to permit of the propeller shaft and engine shaft to be in a straight line. One universal joint is provided to take care of the angularity set up by running over rough roads. The change-speed gear is of the positive clutch type, the pinions being of specially treated nickel steel. This type of transmission, the details of which are not given by the makers, is claimed to be unusually quiet running. So much so as to make the car equally easy and smooth running on the low gear as on the direct drive—something that will be appreciated in hilly or mountainous districts. Another great advantage is to be found in its placing on the rear axle where it is installed as unit in combination with the latter. Large inspection plates are provided so that it is readily accessible without the necessity of a pit or the removal of the car body. The housing is oil-tight, and one packing of heavy grease is said to insure perfect lubrication for 1,000 miles running. For use on American roads a car must have ample clearance, and this has been borne in mind in the design of the Bailey, there being 11 inches clear between the road and the lowest part of the mechanism with 32-inch wheels. The differential is of the spur type, using four pairs of steel pinions of 1 3-8-inch face by 8 pitch; these are hardened, bronze bushed and run on 3-4-inch studs. The outer diameter of the differential case is but 8 inches, and it is made oil-tight.

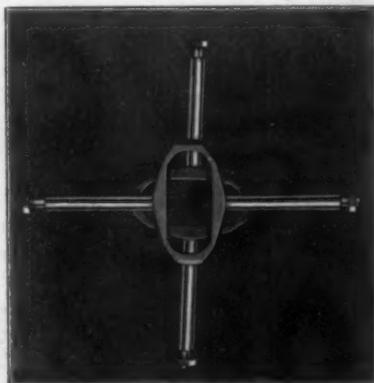
Running Gear and Brakes.—The chassis is mounted on a pressed steel frame of the standard type, while suspension is by means of the usual semi-elliptic

springs in front and full elliptics of patented design in the rear. They are made of high-grade crucible steel, oil-tempered, the forward pair having five leaves each and measuring 1 3-4 by 40 inches, while the full elliptic scroll springs in the rear have four leaves measuring 1 3-4 by 36 inches. Artillery wheels having twelve 1 1-4-inch spokes and measuring 32 by 3 1-2 inches are employed; the rear wheels are made with spottings on each alternate spoke to provide for the brake drum assembly. The two sets of hub brakes provided are on the rear wheels, one of the internal expanding and the other of the external contracting type. They are lined with leather belting, and are extremely powerful, and are normally held out of engagement by mechanical means in order to prevent dragging. They are so designed as to be equally effective whether the car is running forward or backward, thus doing away with the necessity of using a sprag or other back-stop arrangement. The open construction and large diameter of the drums afford an unusual amount of radiating surface, and prevent the lining being burned out when used for severe hill work, which will be appreciated by experienced drivers.

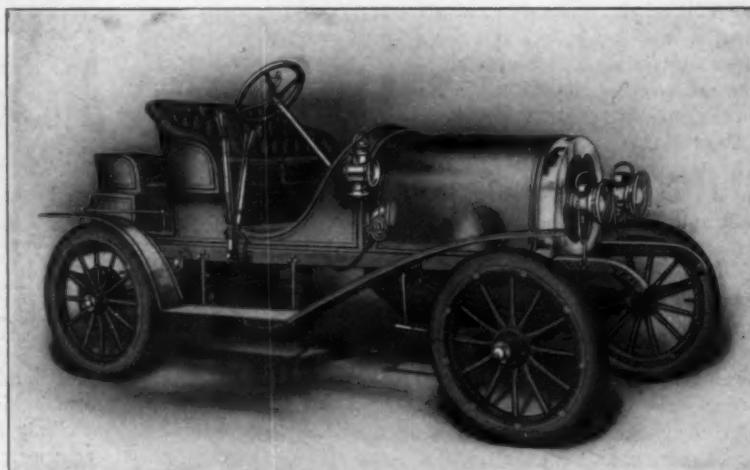
General Details.—The steering gear is of the irreversible type, placed at the right hand side, control being by means of an independent sector placed over the steering wheel but not revolving with it. The wheelbase is 100 inches and the tread standard, and in full running order the complete car only tips the scales at 1,500 pounds. With the usual equipment of side and tail lamps, horn and tools, and as a two-seated runabout, the Model B lists at \$2,000, the provision of an extra rumble seat being optional with the purchaser and costing \$50 extra. The gasoline capacity is 12 gallons. Although entirely out of the ordinary run in a great many ways, the power plant of the new Bailey runabout lends itself very well to the needs of the present-day car as favored by the practically universal demand, and as will be evident from the illustration of the completed car, it differs in no way from the standard type so far as outside appearance is concerned. Its design throughout has been the subject of considerable study on the part of its builders and every part has been given a thorough trying out before adoption, so that they have every confidence in its ability not alone to do all that is claimed for it, but a great deal more.



ROD AND CRANKSHAFT ASSEMBLY.



"SCOTCH YOKE" CONNECTING RODS.



MODEL B 24 HORSEPOWER BAILEY 1907 RUNABOUT.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Secretary F. H. Elliott, of the American Automobile Association, has just bought a Thomas Forty touring model.

The B. L. M. Motor Car & Equipment Company has opened an automobile engineering laboratory in Brooklyn under the management of David Landau. The first four-cylinder manograph ever used in this country has just been received at the laboratory.

The E. R. Thomas Motor Company is just completing a special order for twenty cars, most of which have been shipped, intended for use in and about the Tonopah and Goldfield mining districts. At the present time there are over fifty Thomas cars in use in the two mining camps.

The National Sales Corporation, of New York, has opened a branch at 1436-1438 Michigan avenue, Chicago. This move became necessary owing to the increased line of automobile appliances now handled by the company. F. J. Alvin, for six years with the American Electric Novelty Manufacturing Company, will have charge of the Western branch.

The purchase of a large majority of the stock of the Bryant Steel Wheel and Rim Company, of Columbus, O., by the representatives of the Diamond Rubber Company has given the latter control of the wheel and rim concern. The Marsh rims made by the Bryant company will now be handled by the Diamond Rubber Company as owners, and not as agents.

George E. Risley, the well known salesman of the Electric Vehicle Company, recently addressed the Rivers, Bridges and Roads Committee of the Connecticut Legislature on the advisability of having all vehicles carry a light at night. This measure has the endorsement of all State motorists and indications point to its enactment at an early date.

Enlargements are being made by The Motor Shop, of 317-319 North Broad street, Philadelphia, by the incorporation of the adjoining store at 321. The dividing wall between the old and the new is being pulled down and one large store will be formed. This concern has been handling the Stearns and the Oldsmobile, and recently added the Columbia to its line.

In these days of abundant challenges, Frank Fanning, of the Haynes Automobile Company, says he is willing to let the Haynes record for speed regularity and reliability rest upon the display it made in the last Vanderbilt race. The fact that a stock car was able to make such a wonderful showing against American and foreign autos of double the horsepower, speaks for itself.

Work on the new Winton branch in Pittsburgh is progressing so rapidly that the building will undoubtedly be ready for occupancy by April 15. The structure will be one of the largest automobile establishments and the only manufacturer's branch house in Pittsburgh. A site for the Winton branch in Detroit will be selected within the next ten days, and the building work will then proceed rapidly.

A marked increase in the use of electric vehicles is observable with increased facilities for charging batteries. The Electric Vehicle Company says that further stimulation has been given by the increased num-

ber of private charging plants, which are found to be not only convenient but economical. One owner of a private plant states that he ran his Columbia victoria-phæton 3,850 miles at a cost of \$7.50.

Rainier cars will soon be manufactured at the new factory to be located at Saginaw, Michigan. The Rainier Company recently acquired a tract of land consisting of forty-six acres on which factory buildings are now being erected. There will also be a one-mile track for testing cars. Papers have been filed in Albany increasing the stock of the company to one million dollars, but the directors and management remain the same.

The Standard Fire Extinguisher Company, of Cincinnati, O., recently closed a contract with the De Luxe Motor Car Company, of Detroit, to install a sprinkler system in the De Luxe factory, the cost of which goes into many thousands of dollars. Although the original cost of the system is high, it represents, nevertheless, a profitable investment by greatly reducing fire insurance rates as a result of the increased safety element.

The Automobile Auction Company of America, Inc., has leased the building now occupied by Fiss, Doerr & Carroll Company at 41 and 43 West Sixty-third street. It is the intention of the company to hold weekly auction sales of automobiles. E. Faverry has been engaged as motor expert and will examine each machine entered for the benefit of prospective buyers. J. Hatfield Morton has been retained as auctioneer of the company. The initial sale will take place the first week in April.

No reply has been received to the challenge of E. R. Thomas to match a Thomas Flyer with a British Rolls-Royce car in a run from New York to Chicago and return. One of the conditions of the test was that stock machines at present in use should be employed. The contest would have proved which were the better machines, American or British. One result, however, for the American industry will probably be that European makers will be more careful in their criticisms of American cars.

In its work toward the formation of the Society of American Motor Engineers, the committee of the American Motor Car Manufacturers' Association calls attention to the fact that the engineers in most of the factories of the Association are not mere salaried men who might flitter from one concern to another for an increase in salary, but are invariably part owners of the factories where their cars are made. In this connection might be mentioned J. D. Maxwell, R. E. Olds, Henry Ford, S. H. Mora, W. H. Van Dervoort, R. B. Crawford, L. P. Mooers, A. J. Pierce, W. Bates, James E. Austin and G. P. Dorris.

Many of the difficulties of constructional detail in automobiles have been due to designers having been influenced by their experience with stationary engines, according to David Ferguson, the Buffalo expert. This is peculiarly true in respect to oiling systems, he says, and the fact that the automobile presents entirely different conditions has been tardily grasped. Ferguson is the inventor of an efficient oiling system that was purchased by the George N. Pierce Company. It is far from being a sight feed, for the whole arrangement is under

the hood, but it works automatically and the flow of oil does not vary when the car is going up hill or down.

To test the relative value of contracting and expanding brakes, H. J. Hass, superintendent of the E. R. Thomas Motor Car Company, recently made experiments with two 1907 model Thomas Flyers. Both were fitted with foot brakes on the rear hubs of the contracting leather to metal type. For the hand lever brakes one was equipped with contracting leather to metal brakes on countershaft drums and the other with expanding metal to metal brakes in the interior of rear hubs. Starting them on a 200-yard hill with a 28 per cent. grade, the car with the metal to metal expanding brakes reached the bottom 54 seconds before the other. Further tests on straightways proved so conclusively that the contracting bands always stop the car more quickly than band brakes on the countershaft were adopted.

"Like a new half-sole to a worn shoe" is the way the makers of the "Xtra-Servis" leather treads take of expressing its value to the autoist who is undecided as to whether to have his worn out tires retreaded in the usual manner or replaced with new casings altogether. These treads are built of a special grade of leather and are secured to the tire mechanically as well as by vulcanizing, the edges being sewed to the underside of the tire lips after they have been brought around under the clinch of the rim so as to prevent rim-cutting and bursting. This is an important feature, as it also prevents the tread from loosening or bunching up at the sides. The surface of the tread is shod with a series of steel traction rivets which are insulated from the rubber by a course of leather, so that they cannot heat or cut the tire. These "Xtra-Servis" treads are readily applicable to any worn tire and are made in the usual standard sizes by the American Tire Company, Owosso, Mich., who also make the well-known Salisbury leather tires, as well as "Protecto," which is an interchangeable leather and steel tread for rubber tires and may be applied or removed in a short time whenever desired.

NEW AGENCIES ESTABLISHED.

In Buffalo, the Centaur Motor Car Company will sell the Autocar.

Sears & Burgess have opened the new St. Louis car agency, 1239 Michigan avenue, Chicago.

The firm of Banker Brothers, of Pittsburgh, have taken up the agency for the Aerocar.

The F. E. Boland Motor Company, 239 Halsey street, Newark, N. J., has taken the agency for the American Mors for that city.

The tire products of Torrihon & Cie, of Clermont-Ferrand, France, will be represented in Philadelphia by William Sanford, Jr., & Company at 903 North Broad street.

Ernest Torgler, a member of the insurance firm of Braun & Torgler, of Toledo, O., will shortly open a salesroom and garage for the purpose of handling the Jewell runabout, manufactured at Mansfield, O.

THE AUTOMOBILE.

March 14, 1907.

The Warner Instrument Company has opened a New York branch at 1781 Broadway. A. J. Inderrieden will have charge of the branch and M. J. Dolder, formerly with the Michelin Selling Company, has been added to the selling force.

An important change in agencies is announced by the Continental Caoutchouc Company, which has transferred the distribution of Continental tires for Boston and vicinity from the Angier Company to the newly-established Boston store of the Post & Lester Company at 815 Boylston street.

PERSONAL TRADE MENTION.

E. R. Thomas, president of the big factories that build the cars that bear his name, has gone to Florida for a brief respite from business.

H. Y. McMullen has been appointed resident salesman at the Detroit branch of the Pennsylvania Rubber Company, opened on January 1 under the management of O. H. Joy.

A. D. Caldwell, formerly of the G. & J. Tire Company, and latterly with the Pennsylvania Rubber Company, has connected himself with the Atwood Garage, Toledo, O.

W. C. Whitehead, who has been connected with various large manufacturing interests for many years, has succeeded Herman Broesel as president of the Smith & Mabley Manufacturing Company.

George C. John, sales manager of the St. Louis Car Company, and a member of the Legislative Committee of the American Motor Car Manufacturers' Association, has been appointed on the Legislative Board of the American Automobile Association.

A. W. Church, secretary of Wyckoff, Church & Partridge, is satisfactorily recovering from the accident he met with some time ago when thrown from his carriage. Mr. Church has gone South to recuperate and has taken to fishing as a pastime.

Thomas Henderson, vice-president of the Winton Motor Carriage Company, accompanied by Mrs. Henderson, left Cleveland this week on a leisurely trip to the Pacific Coast. Going and returning, Mr. Henderson will visit Winton representatives in the larger cities of the West.

J. B. Bartholomew, president of the Bartholomew Company, makers of Glide automobiles, recently returned from a three months' trip to South America, which he visited to establish agencies for Glide cars, besides attending to some of his other business affairs in Argentine Republic, where he has some vested interests.

RECENT TRADE REMOVALS.

D. W. Romaine, agent for Marion, Queen and Durvea cars, has removed to a two-story fireproof building at 225-7 Mercer street, Jersey City, N. J.

The De Barrès Auto Company, agents for Delahaye and Pilain automobiles, will shortly occupy the handsome showrooms at 1966-8 Broadway, between Sixty-seventh and Sixty-eighth streets, about to be vacated by the C. G. V. Company. The present De Barrès garage at Park avenue and Sixty-third street will be retained and undergo considerable improvements.

RECENT TRADE PUBLICATIONS.

There is an element of assurance about the new books just issued by the National Motor Car Company, of Indianapolis, Ind. It consists of sixty-four pages of letters from National owners in every part of the Union, all testifying to the good qualities of this well-known machine.

"From the Intake" is the title of a neat little booklet that is being circulated by the Aerocar Company, of Detroit. On the cover is a design showing an intake pipe from the big Model F touring car. It is disconnected from the motor and the contents of the book are supposed to be coming from the intake.

APPLIANCE COMPANY FORMED.

Incorporated with a capital of \$125,000, the Willyoung Appliance Company of Yonkers, N. Y., will undertake the manufacture of coils, magnetos, spark plugs, speedometers, odometers, and similar accessories for motor vehicles and motor boats. The president and manager is Elmer G. Willyoung, a man who has had extensive experience in electrical matters. Mr. Willyoung is a floor member of the American Institute of Electric Engineers, and has been president of the electrical section of the Franklin Institute of Philadelphia. He originated the vacuum process of manufacturing coils, devised the apparatus used by the Postal and Western Union Telegraph Companies for testing and locating faults in cables, and for some time was the electrical expert to Queen & Company, of Philadelphia, and to the Franklin Engineering Company. Associated with Mr. Willyoung will be Benjamin Briscoe, J. D. Maxwell, Jerome Bradley, R. A. Paterson and a number of others.

WILL NOT AMALGAMATE.

The Acme Motor Car Company, of Reading, Pa., states that there is no foundation whatever in the report that the Duryea Power Company will be incorporated with that concern. The Acme Motor Car Company is being reorganized, but business has never been stopped.

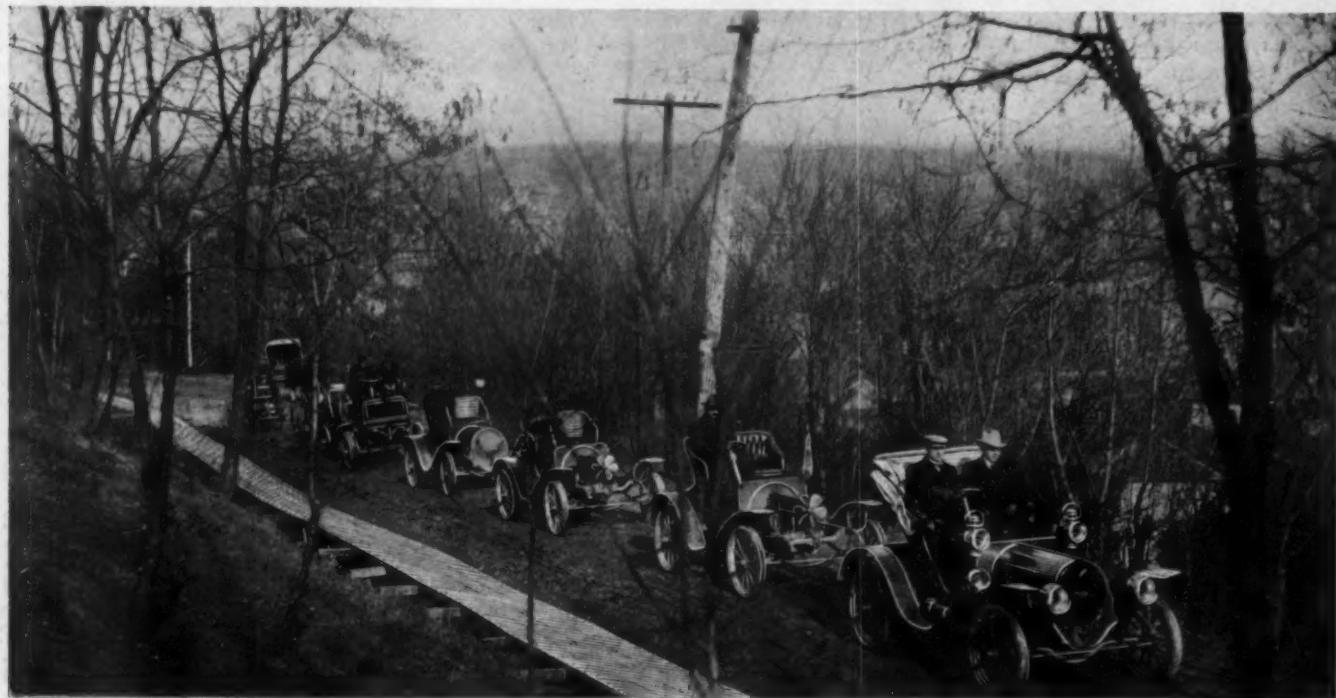
RECENT INCORPORATIONS.

Bowly Auto-Pneumatic Tire Company, Jersey City; capital, \$100,000. Incorporators: William W. Gooch, James B. Mackey, and Ralph B. Crummy.

Mercantile Motor Car Company, Brooklyn; capital, \$50,000. Directors, C. P. Wormwood, 350 Eightieth street; B. L. Lumpkin, and I. H. Smart, Brooklyn.

Rockaway Auto Garage Company, Queens Borough, New York; capital, \$10,000. Directors, A. G. Jennings, C. B. Ehert, and J. T. Curtis, Rockaway Beach.

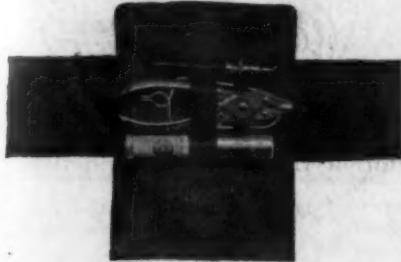
Franco-American Lamp Company, New York; capital, \$5,000. Directors, Nicholas Leewenstein, 157 West Fifty-fourth street; C. S. Hoffman, New York; Leopold Herzstein, Brooklyn.



TESTING LOGAN CARS ON ONE OF THE PICTURESQUE ROADS NEAR THE FACTORY, CHILlicothe, O.

INFORMATION FOR AUTO USERS.

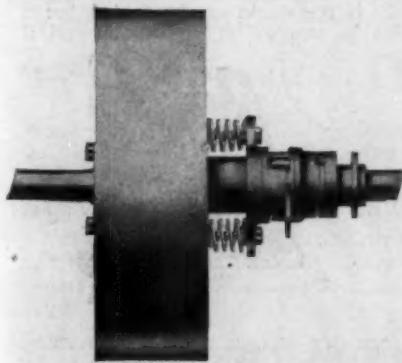
Repairing a Puncture by Old-Time Methods—the kind that proved effective with the bicycle tire, but have fallen so far short of it in the case of its large successor, is a job to try the patience of a saint, particularly when, after all the fussing with patches and cement has been gone through, the patch fails to



"CINCH" TIRE REPAIR KIT.

hold, and the operation must be repeated before many miles have been covered. As an improvement on this process the Auto Goods Company, 60 State street, Boston, Mass., have brought out the "Cinch" tire repair kit, which enables the autoist to make a positive and permanent repair in a fraction of the time required to put on an old-time patch. The complete kit consists of but three tools, a cutter, wire opening tool, and a pair of pliers, in addition to a supply of puncture repairing seals. Inner tubes have been known to give 2,500 miles' service after having been repaired with "cinch" seals.

Hydraulic Oil Clutch.—The Palmbia hydraulic oil clutch has been designed by the North Chicago Machine Company to eliminate the use of speed transmission, except reverse, and give an apparatus with which the car can be run on high gear from one mile per hour to the highest speed of the motor. It consists of a flywheel clutch body bolted to the crankshaft of the motor, taking the place of the flywheel. One and a half to two quarts of oil are poured into the clutch casing through an oil space provided for that purpose. When power is applied to the foot lever a

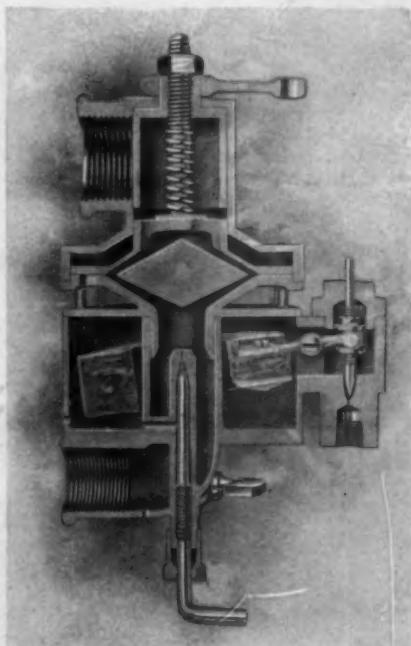


PALMBIA HYDRAULIC OIL CLUTCH.

couple of wedge shaped rings move in opposite directions and force a flange ring inwardly. This acts upon two studs, an auxiliary ring and a cone ring, and causes the latter to follow a slot in piston blade and draw the same towards center or until the blades are flush with

the piston ring. There being then no obstruction to the oil it passes freely round with the flywheel, allowing the driven shaft to remain stationary. Power is applied on releasing the foot pedal, which action confines the oil between the blades within the clutch casing and causes piston rings to revolve with the flywheel. More or less power can be applied according to the control of the foot lever, the gradual advance of the blades towards the outer wall of the flywheel being proportionate to the power transmitted through the clutch to the car.

Nutting Machine Company, Dayton, O.—Under the title of the "Nu Zent" this concern is just placing a novel carbureter on the market. Although it is based on the fundamental principles of carburetion as established by experience during the past several years, it com-



SECTION VIEW OF NU ZENT CARBURETER.

bines them in a somewhat different manner, and in its design embodies some that are quite new. For instance, the level of the float is adjustable from the exterior. Its construction and operation will be evident upon reference to the cut showing it in section. The suction at H causes fresh air to enter at L, producing suction at the spray nozzle and spraying the gasoline against the cone A; the gasoline and air are drawn round the sharp outer edge of the cone and are then thrown against the corrugated surface of the inner side of the auxiliary valve B, from there passing through H to the engine. When the normal air supply is insufficient, the valve B is lifted by the vacuum, causing additional air to enter at J—a port extending around the entire circumference of the carbureter. The valve B lifts in accordance with the speed of the engine, thus making the opening between the cone and the under side of the valve proportionately greater as the speed increases, and insuring a uniform mixture at all speeds.

H. P. Electric Ignition.—The Auto Novelty Company, of Milwaukee, Wis., has purchased the rights for this country of the recently-imported H. P. Electric Ignition System. The "Sure Thing" spark plug has been designed to abolish the

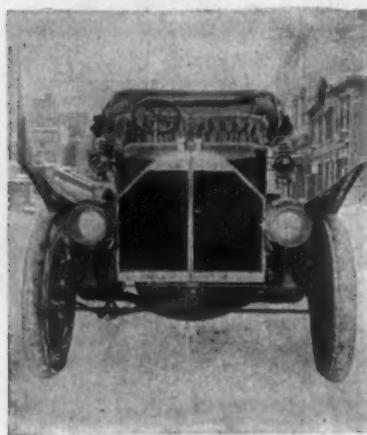


"SURE THING" SPARK PLUG.

nuisance of fouling and short circuiting. Its manufacturers claim that even a continuous flow of oil will not affect its efficiency. A superior quality of imported insulating material is used in its construction, and the metal parts are finely electro-copper plated, nickelized and polished.

Improved Tire Inflation.—Like everything else in connection with the automobile business, the matter of tire inflation has come in for its share of attention and improvement, with the result that we now have, in place of the arduous hand pump, a small portable tank containing a mixture of CO₂ gas and nitrogen, which is liquefied at a temperature of from 65 degrees to seventy degrees under a pressure of about 750 pounds. This gas on being released from the pressure immediately regains its gaseous form and is perfectly dry and beneficial to the rubber. Plain CO₂ or carbonic acid gas has a tendency to filter through the infinitesimal pores of new rubber, and while after the first filling the tires will hold up, the best results are obtained when a little nitrogen is included in the mixture. In filling the tires with compressed air a goodly amount of moisture finds its way into the inner tube, and it is this moisture which sooner or later causes the tire to rot and crack. This gas being a preservative of rubber adds greatly to the life and resiliency of the tire. Another valuable feature is uniformity of pressure. This result can only be obtained where the source of supply is at a constant pressure (the gas being in liquid form, the pressure is always constant) and when the pressure is measured by a reliable gauge. The gas is not in any way inflammable or explosive. The apparatus, complete with gauge, fastens to any convenient portion of the car and weighs a little over twelve pounds; it fills a tire in about five seconds and inflates from twenty-five to thirty tires. Tanks can be recharged or exchanged in any large city, and can be procured direct from the manufacturers, the Standard Carbonic Company, Cincinnati, Ohio.

A Duplex Radiator.—A disadvantage of water-cooled engines is that any accident to the radiator, owing to frost, defective material, bad workmanship or other cause, frequently puts the automobile entirely out of commission. To prevent this the Duplex Radiator Company, of Detroit, Mich.,



FRONT VIEW OF DUPLEX RADIATOR.

has produced a double radiator consisting of two halves which work singly or as a unit. Ordinarily, the entire radiator is in use through double-ended inlet and outlet pipe fitted with four valves. When either half of the radiator leaks, the valves are closed and the defective half is removed for repair, while the remaining half continues in use. Also, during cold weather, when one half of the radiator is sufficient, the remaining half can be freed of water. Another feature of the Duplex system is a by-pass by the use of which, should the pump fail, a water circulation is assured by thermo-syphon.

Gabriel Shock Brake.—The structural feature of the new Gabriel shock brake are two steel springs separated at their extremities by a steel block and securely bolted together. The lower extremity fas-

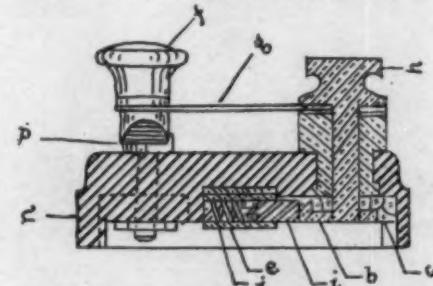


DETAILS OF GABRIEL SHOCK BRAKE.

tens under the clip of the spring by an angle steel plate. Between the two sides of the spring is a double steel plate securely riveted to a stud which extends

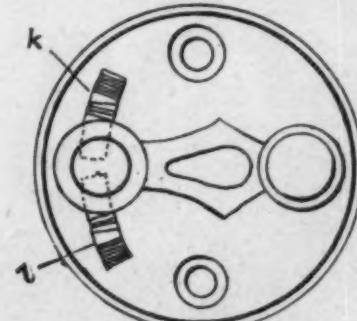
through a slot in the side of the brake nearest the frame and attaches thereto. These double plates are recessed so as to firmly hold a friction composed of camel's hair belting which bears against the inside of the side plates. In addition to the steel blocks used at the upper and lower extremities, there are also inserted thin steel washers which, when removed, bring the two sides closer together, thus securing greater retarding force. Whatever slight longitudinal motion there may be is provided for by the attachment of the clip by a bolt to the bottom of the brake. Side motion of the car is provided for by making an elongated hole for the bolts which bind the side plates at the top, thus allowing each side plate to move independently of the other. The open space between the two sides of the spring is protected by a thin steel strip which gives the article a handsome appearance and prevents mud and dirt from entering the brake. The shock brake is light, compact and substantial and may be adjusted to either elliptic or semi-elliptic springs. It is made in three sizes by the Gabriel Horn Manufacturing Company, of Cleveland, O.

A Combination Switch.—The Pittsfield combination switch is of the click type, provided with a neutral point, A, in the fiber ratchet C. It has also a contact point or projection, D, which forms a part of the circuit when engaged with the spring-actuated steel plunger I. This



SECTION NEW PITTSFIELD SWITCH.

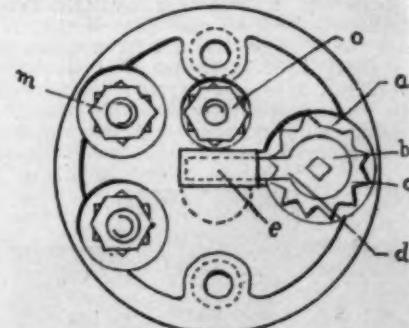
steel plunger is integral with neutral binding post O, thus forming a part of the circuit only when the fiber ratchet is in the position as indicated by bottom



TOP VIEW PITTSFIELD SWITCH.

view of switch in the drawing. This point of contact can readily be found by the operator, who knows how many clicks to count from the neutral point A in either direction. On the other hand, anyone not familiar with the combination will be unable to establish a circuit. The contact lever G is a fixture on the switch and is not detachable. The knob H serves a thumb piece for rotating fiber ratchet O for the purpose of either opening or closing the circuit. The neutral binding

post connected directly to the units or coils is represented by O. The battery binding post is shown by M. This bind-



BOTTOM VIEW, SHOWING CONNECTIONS.

ing post is represented on the face or outside of the switch by the contact steps K and L.

Divided Wind Shield.—A glance at the accompanying cut will explain the nature of the Beecher divided wind shield now being constructed by the Limousine-Carriage Manufacturing Company, of Chicago. The shield was put on the market to meet the demand for something cheaper



BEECHER DIVIDED WIND SHIELD IN PLACE.

than the "Schildback." It has the same light center bar, but is hinged on this model. The small wheel which shows at the top of circle when glass is raised is on a bolt fastened to top frame and has a 1 1/2-inch stem with a loose washer next to the circle. By simply loosening these two wheels the shield can be folded, but it can also be stopped at any angle, and if the



BEECHER DIVIDED WIND SHIELD FOLDED.

lamps are in the way can be held perfectly rigid so as to clear them. All fittings and rods are solid brass, the frame is bound with half-oval polished brass, bottom boards are left six inches wide so they can be cut out to fit any shape dash. Size of frame is 40 by 33 high, allowing two inches between glass and dash. It is made in mahogany finish, natural ash or black.